

JAPANESE

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE
INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1] It is the image processing system characterized by to be the image processing system held for a storage means to by_which a control program is rewritable, to have the control means which controls the whole equipment according to said control program, and the rewriting means which rewrite said control program, and for said control means to direct processing in_which it can operate in the case of rewriting by said rewriting means, and to permit actuation of this processing in the case of rewriting by said rewriting means.

[Claim 2] Said storage means is an image processing system according to claim 1 characterized by including a flash ROM.

[Claim 3] Said storage means is an image processing system according to claim 2 characterized by including EEPROM.

[Claim 4] Processing in which it can operate in the case of rewriting by said rewriting means is an image processing system according to claim 1 characterized by said control program being the processing which does not involve directly.

[Claim 5] Furthermore, the storage means in which said rewriting is possible is an image processing system according to claim 4 characterized by processing in which it has the 2nd control program for the 2nd different storage means, and can operate in the case of rewriting by said rewriting means being processing by said 2nd control program.

[Claim 6] Said 2nd storage means is an image processing system according to claim 5 characterized by the ability not to rewrite.

[Claim 7] Furthermore, it is the image processing system according to claim 1 characterized by reporting the purport which is under rewriting in the case of rewriting have an information means to report a device status to an operator, and according [said information means] to said rewriting means.

[Claim 8] Said information means is an image processing system according to claim 7 characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.

[Claim 9] The control means which is the image processing system held for a storage means by which a control program is rewritable, and controls the whole equipment according to said control program, Have the rewriting means which rewrites said control program, and said storage means divides and holds said control program to two or more modules. Said rewriting means rewrites in said module unit. Said control means The image processing system characterized by directing processing in which it can operate in the case of rewriting by said rewriting means, from said two or more modules, and permitting actuation of this module in the case of rewriting by said rewriting means.

[Claim 10] Said control means is an image processing system according to claim 9 characterized by interrupting said rewriting when said directed module operates in the case of rewriting by said rewriting means.

[Claim 11] Said storage means is an image processing system according to claim 9 characterized by including a flash ROM.

[Claim 12] Said storage means is an image processing system according to claim 11

characterized by including EEPROM.

[Claim 13] Furthermore, it is the image processing system according to claim 9 characterized by reporting the purport which is under rewriting in the case of rewriting have an information means to report a device status to an operator, and according [said information means] to said rewriting means.

[Claim 14] Said information means is an image processing system according to claim 13 characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.

[Claim 15] The image-processing approach characterized by being the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, directing processing in which it can operate in case said control program is rewritten, and permitting actuation of this processing in the case of rewriting.

[Claim 16] It is the image-processing approach characterized by being the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, for said storage means dividing and holding said control program to two or more modules, directing processing in which it can operate in case said control program is rewritten in said module unit, from said two or more modules, and permitting actuation of this module in the case of rewriting.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image processing system which rewrites the control program provided in an image processing system, and its approach, concerning an image processing system and its approach.

[0002]

[Description of the Prior Art] PROM (programmable ROM) which can write in a program, and EPROM (erasable PROM) of an ultraviolet-rays elimination mold were used the mask ROM which wrote in fixed data (control program) in the production process from before as nonvolatile memory which stores the control program in an image processing system, and after manufacture. In recent years, EEPROM (electrically erasable and programmable ROM) which is rewritable nonvolatile memory electrically is developed as memory replaced with these, and using these also in an image processing system is proposed. By using the nonvolatile memory in which such rewriting is possible, it became possible easily for it to become unnecessary to perform ROM exchange in the case of correction of a control program and modification, and to rewrite this program on an onboard. Thereby, when it was the image processing system connected through the network, the control program could also be rewritten using the communication link from the remote place.

[0003]

[Problem(s) to be Solved by the Invention] However, in the image processing system which stored the control program in the rewritable nonvolatile memory mentioned above, when this control program was rewritten, this image processing system needed to stop the whole of the function. That is, since other processings were not able to be performed during rewriting actuation of memory, there was a problem that processing effectiveness will fall.

[0004] It is made in order that this invention may solve the technical problem mentioned above, and it aims at offering the image processing system which can perform a certain image processing, and its approach during rewriting actuation of a control program.

[0005]

[Means for Solving the Problem] The image processing system of this invention is equipped with the following configurations as a way stage for attaining the purpose mentioned above.

[0006] That is, it is the image processing system which held for a storage means to by which a control program is rewritable, and it has the control means which controls the whole equipment according to said control program, and the rewriting means which rewrites said control program, said control means directs processing in which it can operate in the case of rewriting by said rewriting means, and it is characterized by to permit actuation of this processing in the case of rewriting by said rewriting means.

[0007] For example, it is characterized by said storage means containing a flash ROM.

[0008] For example, it is characterized by said storage means containing EEPROM.

[0009] For example, processing in which it can operate in the case of rewriting by said rewriting means is characterized by said control program being the processing which does not involve directly.

[0010] Furthermore, the storage means in which said rewriting is possible is characterized by processing in which it has the 2nd control program for the 2nd different storage means, and can operate in the case of rewriting by said rewriting means being processing by said 2nd control program.

[0011] For example, said 2nd storage means is characterized by the ability not to rewrite.

[0012] Furthermore, it has an information means to report a device status to an operator, and said information means is characterized by reporting the purport which is under rewriting in the case of rewriting by said rewriting means.

[0013] For example, said information means is characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.

[0014] Moreover, the control means which is the image processing system held for a storage means by which a control program is rewritable, and controls the whole equipment according to said control program, Have the rewriting means which rewrites said control program, and said storage means divides and holds said control program to two or more modules. Said rewriting means rewrites in said module unit, said control means directs processing in which it can operate in the case of rewriting by said rewriting means, from said two or more modules, and it is characterized by permitting actuation of this module in the case of rewriting by said rewriting means.

[0015] For example, said control means is characterized by interrupting said rewriting, when said directed module operates in the case of rewriting by said rewriting means.

[0016] For example, it is characterized by said storage means containing a flash ROM.

[0017] For example, it is characterized by said storage means containing EEPROM.

[0018] Furthermore, it has an information means to report a device status to an operator, and said information means is characterized by reporting the purport which is under rewriting in the case of rewriting by said rewriting means.

[0019] For example, said information means is characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.

[0020] The image-processing approach of this invention is equipped with the following processes as a way method for attaining the purpose mentioned above.

[0021] That is, it is the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, and processing in which it can operate in case said control program is rewritten is directed, and it is characterized by permitting actuation of this processing in the case of rewriting.

[0022] Moreover, it is the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, and said storage means divides and holds said control program to two or more modules, processing in which it can operate in case said control program is rewritten in said module unit is directed from said two or more modules, and it is characterized by permitting actuation of this module in the case of rewriting.

[0023]

[Embodiment of the Invention] Hereafter, 1 operation gestalt concerning this invention is explained to a detail with reference to a drawing.

[0024] <1st operation gestalt> drawing 1 is the block diagram showing the configuration of the image processing system in this operation gestalt. In drawing 1, 10 is an image processing system, 11 is external devices, such as a host computer, and the predetermined interface connects mutually. Moreover, for 1, as for the printer section and 3, in an image processing system 10, the reader section and 2 are [the facsimile section and 4] hard disks.

[0025] Hereafter, the actuation in the above-mentioned configuration is explained. First, the reader section 1 reads optically the image of the manuscript laid in the non-illustrated manuscript base, and outputs the image data according to a manuscript image to the printer section 2 and the facsimile section 3. In addition, in the image processing system 10 of this operation gestalt, it shall have the memory set as the rewriting object of the program mentioned later in the reader section 1. The printer section 2 records the image according to the image data inputted through the reader section 1 and the facsimile section 3 on a record medium. The facsimile section 3 compresses the image data to which the so-called reception which is

connected to the reader section 1, elongates the compression image data which received through the dial-up line, and transmits the this elongated image data to the reader section 1 was performed, and the facsimile section 3 has been transmitted from the reader section 1, and transmits the this compressed image data to the phase hand set up through the dial-up line. The hard disk 4 is connected to the facsimile section 3, and the compression image data which received can be saved temporarily. Moreover, an external device 11 is a host computer, and as it is mentioned later, it rewrites memory in the reader section 1.

[0026] Hereafter, the reader section 1 and the printer section 2 are explained to a detail. In this operation gestalt, it has the reader section 1 and the printer section 2 as equipment of one, and the sectional side elevation is shown in drawing 2. In the reader section 1, 101 is a manuscript feeding device, feeds up to platen glass 102 with one manuscript at a time sequentially from the last page, and discharges the manuscript on platen glass 102 after reading actuation termination of a manuscript. If a manuscript is conveyed on platen glass 102, a lamp 103 will light up and the exposure scan of the manuscript will be carried out by starting migration of the scanner unit 104. The reflected light from the manuscript at this time is led to CCD series (Following CCD is called) 109 with a mirror 105,106,107 and a lens 108. Thus, the image data of the manuscript scanned on platen glass 102 is read by CCD109. The image data outputted from CCD109 is transmitted to the printer section 2 or the facsimile section 3, after a predetermined image processing is performed.

[0027] 221 is a laser driver, drives the laser light-emitting part 201, and makes the laser beam according to the image data outputted from the reader section 1 emit light in the printer section 2. This laser beam is irradiated by the photoconductor drum 202, and the latent image according to a laser beam is processed by the photoconductor drum 202. The part of the latent image of this photoconductor drum 202 adheres to a developer with a development counter 203. And to the timing which synchronized with exposure initiation of a laser beam, paper is fed to the recording paper from either a cassette 204 and the cassette 205, it conveys to the imprint section 206, and the developer to which the photoconductor drum 202 adhered is imprinted on this recording paper. The recording paper with which the developer got is conveyed by the fixing section 207, and the recording paper is fixed to a developer by being heated and pressurized. The recording paper which passed the fixing section 207 is discharged with the discharge roller 208. By containing the discharged detail paper into each bottle, a sorter 220 classifies the detail paper. In addition, when the classification in a sorter 220 is not set up, the recording paper is contained into the best bottle. Moreover, when double-sided record is set up, after even the discharge roller 208 conveys the recording paper, the hand of cut of the discharge roller 208 is reversed, and the recording paper is led to a re-feeding conveyance way by the flapper 209. Moreover, when multiplex record is set up, it leads to a re-feeding conveyance way by the flapper 209 so that even the discharge roller 208 may not convey the recording paper. The recording paper led to the re-feeding conveyance way is fed to the imprint section 206 to the timing mentioned above.

[0028] The detail block configuration of the reader section 1 is shown in drawing 3. In drawing 3, the A/D-SH section in which 109 performs CCD and 110 performs A/D conversion and a shading compensation, the image-processing section in which 111 performs various image processings, the I/F section in which 113 manages an interface with the facsimile section 3, the control unit to which, as for 115, directions input, condition information of equipment, etc. are performed by the operator, and 117 are the I/F sections which manage an interface with an external device 11, and it has SCSI, RS-232C, etc.

[0029] 114 is CPU which controls each configuration of the reader section 1 in generalization, and 116 is the memory which stored the control program referred to and performed by CPU114. Memory 116 is constituted by EEPROM etc., is rewritten in this operation gestalt, and is the target memory.

[0030] As for the image data outputted from CCD109, a shading compensation is performed while analog-to-digital conversion is performed in the A/D-SH section 110. The image data processed by the A/D-SH section 110 is transmitted to the facsimile section 3 through the I/F section 113 while it is transmitted to the printer section 2 through the image-processing section

111. CPU114 controls the image-processing section 111 and the I/F section 113 according to the contents of a setting set up by the control unit 115. For example, after making trimming processing perform in the image-processing section 111, it is made to transmit to the printer section 2, when the copy mode which copies by performing trimming processing by the control unit 115 is set up. Moreover, when the facsimile transmitting mode is set up by the control unit 115, the control command according to image data and the set-up mode is made to transmit to the facsimile section 3 from the I/F section 113. The control program of CPU114 which performs such processing like mentioned above is memorized by memory 116. Moreover, memory 116 is used also as a working area of CPU114.

[0031] Next, the detail configuration of memory 116 is explained. Drawing 4 is the block diagram showing the configuration of the memory 116 shown in drawing 3. Memory 116 is constituted by a flash ROM 1161, and EPROM1162 and RAM1163 in drawing 4. Moreover, 118 and 119 are the address buses and data buses of CPU114, respectively. A flash ROM 1161 is rewritable nonvolatile memory which has memorized the control program for the normal operation of the reader section 1, and consists of an EEPROM etc. EPROM1162 has memorized the download program at the time of rewriting a flash ROM 1161. Moreover, RAM1163 is used as the backup data storage of the reader section 1, and a working area of CPU114.

[0032] Hereafter, the actuation in the case of performing the so-called version up processing which rewrites the control program of the reader section 1 by the external device 11 in the image processing system 10 of a configuration as mentioned above is considered. At this time, an external device 11 is a host computer and transmits the control program memorized in the flash ROM 1161 shown in drawing 4 through the interface 117 of RS-232C to an image processing system 10 side. Then, CPU114 makes a flash ROM 1161 memorize the received control program, referring to the download program memorized by EPROM1162.

[0033] In this case, the flash ROM 1161 is rewriting mode and cannot perform the usual read-out actuation. Therefore, in the reader section 1, it will be in the condition that normal operation cannot be performed. Then, in this operation gestalt, in case a flash ROM 1161 is rewritten, that is notified to the printer section 2 and the facsimile section 3. And in the printer section 2 and the facsimile section 3, the whole of the actuation is stopped about the module which cannot operate if the reader section 1 is not operating, and even if the reader section 1 is not operating, about the module which can operate, actuation is continued as it is. For example, in this operation gestalt, only the function to save the compression image data which received through the dial-up line in the facsimile section 3 at a hard disk 4 enables ***** actuation in the condition of the reader section 1.

[0034] Here, the detail configuration of the facsimile section 3 is shown in the block diagram of drawing 5. In drawing 5, 31 is CPU which controls actuation of the facsimile section 3, and 32 is the memory holding the control program in the facsimile section 3. It is the nonvolatile memory which is not rewritable (mask ROM etc.), and memory 32 is equipped with the receiving module and the transmitting module as a control program. 33 and 35 are the I/F sections which take an interface with communications-partner equipment and the reader section 1, respectively, and 34 is the image-processing section which performs elongation processing of a receiving image, compression processing of a transmitting image, etc. In addition, it is elongated in the image-processing section 34, and the image data received through I/F33 in the facsimile section 3 is stored in a hard disk 4.

[0035] The flow chart shown in drawing 6 is referred to hereafter, and the detail of actuation of the reader section 1 at the time of memory rewriting activation of this operation gestalt is explained. The program which the processing shown in the flow chart of drawing 6 shows the processing at the time of downloading the flash ROM 1161 of the reader section 1, and realizes this processing is beforehand memorized by EPROM1162 as a download program. This download program is started by rewriting from an external device 11 and receiving the command of activation, and is executed by CPU114.

[0036] If the reader section 1 rewrites from the host computer of an external device 11 and receives the command of activation, it will wait to be judged, and to become return and rewritable at step S101, if it is not rewritable whether a control program is rewritable in step

S101 first. Here, the case where current copy processing, the facsimile transmission / reception of an image processing system 10, etc. are working, it is intermediate states, such as a paper jam and those without paper, as a condition which is not rewritable, or they are some abnormal conditions, such as abnormality heating of a heating roller, can be considered.

[0037] Progressing to step S102 at step S101, if a control program is rewritable, CPU114 transmits the rewriting initiation command which shows that rewriting of a control program was started to the printer section 2 and the facsimile section 3. At this time, even if a control program is rewriting CPU114, it adds the information on the function in which it can operate, as functional information to the rewriting initiation command to transmit.

[0038] In the reader section 1, it has the list of a module which operates in the facsimile section 3 in memory 116. That is, it has the information about the receiving module and transmitting module in the facsimile section 3. In addition, CPU114 may be made to ask the module in memory 32 to CPU31 of the facsimile section 3.

[0039] Thus, in case it rewrites in step S102 and an initiation command is transmitted, the module which can operate in the facsimile section 3 can be judged. For example, what is necessary is just to form the flag which shows whether it can operate at the time of rewriting in the module list of operation in memory 116. In the receiving module in the facsimile section 3, since the received signal is stored in a hard disk 4, even if the memory 116 in the reader section 1 rewrites this and it is inside, it can operate, but by the transmitting module, since the reader section 1 needs to generate a sending signal, it cannot operate during rewriting.

[0040] And it progresses to step S103, and CPU114 is rewritten and displays the operating state under activation on a control unit 115. In this operation gestalt, the purport in which the display of the purport which is [rewriting] under activation and the auto-receipt of facsimile are possible is displayed.

[0041] Then, it progresses to step S104 and rewriting of a control program is performed to a flash ROM 1161. At this time, only the function (receiving module in the facsimile section 3) shown using the functional information which rewrote at step S102 and was added to the initiation command can operate. That is, during rewriting activation, it is possible to save the compression image data which received through the telephone line in the facsimile section 3 at a hard disk 4.

[0042] After rewriting of a flash ROM 1161 is completed, it progresses to step S105, and the rewriting quit command which shows that rewriting of a control program ended CPU114 in the printer section 2 and the facsimile section 3 is transmitted.

[0043] Then, it progresses to step S106, and CPU114 displays the purport in which normal operation is possible on a control unit 115, and returns to normal operation after that. For example, in this operation gestalt, if reception was performed in the facsimile section 3 during rewriting activation, the received data stored in the hard disk 4 will be outputted from the printer section 2.

[0044] In addition, when the function of an image processing system 10 changes a lot by rewriting of a control program, once turning OFF the body power source of an image processing system 10, reboot may be applied by setting to ON again. In this case, in step S106, a display to that effect is performed to a control unit 115, and reboot is demanded from an operator.

[0045] Next, the flow chart shown in drawing 7 is referred to, and actuation of the facsimile section 3 at the time of memory rewriting activation is explained to a detail.

[0046] The processing shown in the flow chart of drawing 7 shows the processing in the FAKURIMIRI section 3 at the time of downloading the flash ROM 1161 of the reader section 1. The program which realizes this processing is held at ROM which is not illustrated in the facsimile section 3, and is started by rewriting from CPU114 and receiving an initiation command.

[0047] The module (receiving module) which can operate is chosen from the functional information to which the facsimile section 3 rewrites from the reader section 1, and receives an initiation command, which it was not rich and was received in step S201 and which rewrites and is added to the initiation command in the facsimile section 3. Next, it progresses to step S202 and the facsimile section 3 is changed into the condition that only the module which can operate

can be performed. And it judges whether it progressed to step S203, and rewrote from the reader section 1, and the quit command was received. Actuation of only the module in step S202 which can be operated is continued until it receives return and a rewriting quit command to step S202, if it has not received. If it rewrites in step S203 and a quit command is received, it will progress to step S204, and it returns to the usual actuation.

[0048] In addition, in this operation gestalt, it explained for being only a receiving module in the FAKURIMIRI section 3 as a module which can operate during rewriting of a control program, but if it is the function which does not need the direct control by the reader section 1, not only the facsimile section 3 but this invention is applicable.

[0049] According to this operation gestalt, even if the control program of an image processing system is rewriting to the appearance explained above, about the function in which ***** actuation is possible, actuation can be continued as it is at it in actuation of this control program. Therefore, it is upgradable suitably, working an image processing system efficiently.

[0050] The 2nd operation gestalt concerning this invention is explained below the <2nd operation gestalt>.

[0051] Drawing 8 is the block diagram showing the configuration of the image processing system in the 2nd operation gestalt. In drawing 8, 51 is the reader section, reads the manuscript image laid in the non-illustrated manuscript base, and outputs the image data according to this manuscript image to the printer section 52 and image I/O control unit 53. The printer section 52 records and outputs the image according to the image data transmitted from the reader section 51 and image I/O control unit 53 in the record paper. It connects with the reader section 51 and image I/O control unit 53 consists of the facsimile section 54, the file section 55, the computer interface section 57, the formatter section 58, the image memory section 59, and core section 60 grade.

[0052] The facsimile section 54 elongates the compression image data which received through the dial-up line, and transmits the this elongated image data to the core section 60. Moreover, it is transmitted from the core section 60, image data is compressed, and the this compressed image data is transmitted to the destination specified through the dial-up line. The hard disk 62 is connected to the facsimile section 54, and the compression image data which received can be saved temporarily.

[0053] The Magnetic-Optical disk drive unit 56 is connected to the file section 55. The file section 55 compresses the image data transmitted from the core section 60, and is made to memorize it with the keyword for searching this image data to the removable magneto-optic disk set to the Magnetic-Optical disk drive unit 56. Moreover, the file section 55 searches the compression image data memorized by the magneto-optic disk based on the keyword transmitted through the core section 60. And the searched compression image data is read, it elongates, and the this elongated image data is transmitted to the core section 60.

[0054] The computer interface section 57 is a part which manages the interface between a personal computer or a workstation (PC/WS) 61, and the core section 60. The formatter section 58 develops expression grinding code data for the image transmitted from PC/WS61 to the image data of a format recordable in the printer section 52. The image memory section 59 memorizes temporarily the data transmitted from PC/WS61.

[0055] In addition, although later mentioned about the detail of the core section 60, the core section 60 controls the data flow between each of the reader section 51, the facsimile section 54, the file section 55, the computer interface section 57, the formatter section 58, and the image memory section 59. Moreover, in the 2nd operation gestalt, memory in the reader section 51 shall be rewritten by using an external device 63 as a host computer.

[0056] In addition, although it has the reader section 1 and the printer section 2 as equipment of one in the 2nd operation gestalt, since the sectional side elevation is the same as that of drawing 2 shown in the 1st operation gestalt mentioned above, explanation is omitted.

[0057] The detail block configuration of the reader section 51 is shown in drawing 9. In drawing 9, the A/D-SH section in which 159 performs CCD and 150 performs A/D conversion and a shading compensation, the image-processing section in which 151 performs various image processings, the I/F section in which 153 manages an interface with image I/O control unit 53,

the control unit to which, as for 155, directions input, condition information of equipment, etc. are performed by the operator, and 157 are the I/F sections which manage an interface with an external device 11, and it has SCSI, RS-232C, etc.

[0058] 154 is CPU which controls each configuration of the reader section 51 in generalization, and 156 is the memory which stored the control program referred to and performed by CPU154. Memory 156 is constituted by EEPROM etc., is rewritten in this operation gestalt, and is the target memory.

[0059] As for the image data outputted from CCD159, a shading compensation is performed while analog-to-digital conversion is performed in the A/D-SH section 150. The image data processed by the A/D-SH section 150 is transmitted to the core section 60 of image I/O control unit 53 through the I/F section 153 while it is transmitted to the printer section 2 through the image-processing section 151. CPU154 controls the image-processing section 151 and the I/F section 153 according to the contents of a setting set up by the control unit 155. For example, after making trimming processing perform in the image-processing section 151, it is made to transmit to the printer section 2, when the copy mode which copies by performing trimming processing by the control unit 155 is set up. Moreover, when the facsimile transmitting mode is set up by the control unit 155, the control command according to image data and the set-up mode is made to transmit to the core section 60 from the I/F section 153. The control program of CPU154 which performs such processing like mentioned above is memorized by memory 156. Moreover, memory 156 is used also as a working area of CPU154.

[0060] The detail block configuration of the core section 60 is shown in drawing 10 . The I/F section in which 120 takes an interface with other configurations in image I/O control unit 53, the data-processing section in which 121 performs an image processing, the I/F section in which 122 takes an interface with the reader section 51, CPU by which 123 controls the core section 60 whole, and 124 are the memory which stored the control program performed by CPU123 [in the core section 60] .

[0061] The image data and control command which have been transmitted from the reader section 51 are inputted into the data-processing section 121 and CPU123, respectively. Image processings, such as rotation and variable power, are performed in the data-processing section 121, and the transmitted image data is transmitted through the I/F section 120 according to the contents of control command to the facsimile section 54, the file section 55, or the computer interface section 57.

[0062] Moreover, after the code data showing an image inputted through the computer interface 57 are transmitted to the data-processing section 121, they are transmitted to the formatter section 58. And after being developed by image data in the formatter section 58, this image data is transmitted to the data-processing section 121, and is transmitted to the facsimile section 54 or the printer section 52.

[0063] After the image data from the facsimile section 54 is transmitted to the data-processing section 121, it is transmitted to the printer section 52, the file section 55, or the computer interface section 57. Moreover, after the image data from the file section 55 is transmitted to the data-processing section 121, it is transmitted to the printer section 52, the facsimile section 54, and the computer interface section 57.

[0064] CPU123 performs control which was mentioned above according to the control program memorized by memory 124 and the control command transmitted from the reader section 51. In addition, memory 124 is used also as a working area of CPU123.

[0065] It is possible to perform processing which was explained above and which compounded [in / like / the image processing system of the 2nd operation gestalt] functions, such as reading of a manuscript image, a print of an image, transmission and reception of an image, preservation of an image, and I/O of the data from a computer, focusing on the core section 60.

[0066] Next, the detail configuration of the memory 156 in the reader section 51 is explained. Drawing 11 is the block diagram showing the configuration of the memory 156 shown in drawing 9 . Memory 156 is constituted by a flash ROM 1561 and RAM1562 in drawing 11 . Moreover, 158 and 159 are the address buses and data buses of CPU154, respectively. The flash ROM 1561 has memorized the control program for the normal operation of the reader section 51, and is the

rewritable nonvolatile memory of EEPROM etc. Moreover, RAM1563 is used as the backup data storage of the reader section 51, and a working area of CPU154.

[0067] The internal configuration of a flash ROM 1561 is shown in drawing 12 here. As shown in drawing 12, a flash ROM 1561 is divided into 16 blocks shown by 1100-1115, and the module according to individual is stored for every block. In case a flash ROM 1561 rewrites, although it rewrites and becomes the mode, it is the thing which cannot perform the usual read-out actuation and for which rewriting is interrupted temporarily, and the read-out actuation of it is attained. Moreover, a flash ROM 1561 is rewritable in this block unit.

[0068] In the flash ROM 1561 shown in drawing 12, in case a flash ROM 1561 is rewritten for block 1100, the download program referred to by CPU154 is memorized, and in order that only this block may forbid rewriting, it is protected in hard. In case it rewrites to other blocks, CPU154 controls transmitting the download program memorized by the block 1100 to RAM1562, and referring to the this transmitted program. Moreover, block 1101 to the block 1107 has memorized the control program about the reader section 51. Moreover, block 1108 to the block 1112 has memorized the program of each control unit, and makes block 1115 a reserve field from block 1113.

[0069] In the image processing system of the 2nd operation gestalt which makes hereafter a configuration which was mentioned above, the actuation in the case of performing the so-called version up processing which rewrites the control program of the reader section 51 by the external device 63 is considered. At this time, an external device 63 is a host computer and transmits the control program memorized in the flash ROM 1561 shown in drawing 11 through the interface 157 of RS-232C to an image processing system side. Then, CPU154 makes a flash ROM 1561 memorize the received control program, referring to the download program transmitted to RAM1562.

[0070] Although the time of rewriting mode becomes impossible as for the usual read-out, read-out of the flash ROM 1561 in the 2nd operation gestalt becomes possible by interrupting rewriting temporarily. Then, in the 2nd operation gestalt, in case a flash ROM 1561 is rewritten, the following control is performed.

[0071] That is, about the module which can be performed combining the program within a block unrelated to the block to rewrite, read-out is made possible. And when a run command occurs to the module which can be performed at the time of rewriting mode, after interrupting rewriting temporarily, performing preferentially actuation to the module which can be performed and completing this actuation, it rewrites again. For example, considering the case where rewriting for adding the function in the file manipulation section shown especially in the block 1111 of drawing 12 to the control program in a flash ROM 1561 is performed, performing the usual processing in this case about each control unit (it corresponding to blocks 1109, 1110, and 1112, respectively) of a copy, facsimile, and a printer is permitted.

[0072] Next, the flow chart shown in drawing 13 is referred to, and actuation of the reader section 51 at the time of memory rewriting activation is explained to a detail. The program which the processing shown in the flow chart of drawing 13 shows the processing at the time of downloading the flash ROM 1561 of the reader section 51, and realizes this processing is beforehand memorized by the block 1100 of a flash ROM 1561. By rewriting from an external device 11 and receiving the command of activation, this download program is transmitted to RAM1562, and is executed by CPU154.

[0073] If the reader section 51 rewrites from the host computer of an external device 11 and receives the command of activation, it will wait to be judged, and to become return and rewritable at step S301, if it is not rewritable whether a control program is rewritable in step S301 first. Here, the case where current copy processing, the facsimile transmission / reception of an image processing system 10, etc. are working, it is intermediate states, such as a paper jam and those without paper, as a condition which is not rewritable, or they are some abnormal conditions, such as abnormality heating of a heating roller, can be considered.

[0074] Progressing to step S302 at step S301, if a control program is rewritable, CPU154 stops all the functions about the module within the block which is a candidate for rewriting. For example, as mentioned above, when rewriting to the file manipulation module shown in block 1111

is performed, CPU154 displays the purport whose file manipulation becomes impossible from this on a control unit 155, and publishes the command which shows that the file section 55 is invalid to image I/O control unit 53. In addition, in a control unit 155, all displays about file manipulation may be suspended at this time.

[0075] Next, it progresses to step S303 and an image processing system shifts to rewriting mode. And in step S304, rewriting of a control program (in this case, only block 1111) is performed to a flash ROM 1561.

[0076] And after rewriting of a flash ROM 1561 is completed, it progresses to step S305 and rewriting mode is ended. Then, in step S306, the module stopped at step S302 for rewriting is rebooted.

[0077] Although memory rewriting processing in the 2nd operation gestalt is performed as it explained above, in the 2nd operation gestalt, it is characterized by the thing which were mentioned above and for which other actuation is given priority to and performed during memory rewriting like. Hereafter, the interruption interruption processing under rewriting processing is explained with reference to the flow chart of drawing 14 .

[0078] Suppose [be / it / under / rewriting processing activation / which is shown in step S304 of drawing 13 mentioned above / setting] that interruption of the activation demand to a certain module which can be operated was received. For example, the print run command to the module in the printer control unit of the block 1112 shown in drawing 12 etc. corresponds to this interrupt request. Then, CPU154 starts interruption interruption processing. First, in step S311, it is interrupted temporarily and CPU154 changes rewriting to the block 1111 of a flash ROM 1561 into the condition which can read a flash ROM 1561.

[0079] Next, it progresses to step S312 and the module with an operational request which can be operated is performed. And if actuation of this module is completed, it will progress to step S313, and it judges whether there is any operational request interruption to other modules which can be operated. When there is interruption to other modules, processing returns to step S312 and performs the module concerned.

[0080] On the other hand, if other interruption cannot be found in step S313, it will progress to step S314, and momentary interruption of the rewriting processing by step S311 is canceled, and it changes into the condition that a flash ROM 1561 is rewritable.

[0081] And return and rewriting processing can be resumed to step S304 shown in drawing 13 .

[0082] Even if the control program of an image processing system is rewriting to the appearance explained above according to the 2nd operation gestalt, about high processing of a priority, rewriting processing can be interrupted to it, this processing can be performed, and rewriting processing can be rerun after the termination. Therefore, it is upgradable suitably, working an image processing system efficiently.

[0083] Moreover, even if it applies this invention to the system which consists of two or more devices, such as a host computer, an interface, and a printer, it may be applied to the equipment which consists of one devices, such as a copying machine. Moreover, it cannot be overemphasized that this invention can be applied also when carrying out by supplying a program to a system or equipment. In this case, the storage which stored the program concerning this invention will constitute this invention. And the system or equipment operates by the method defined beforehand by reading the program from this storage to a system or equipment.

[0084]

[Effect of the Invention] According to this invention, even if the control program of an image processing system is rewriting to the appearance explained above, about the function in which ***** actuation is possible, actuation can be continued as it is at it in actuation of this control program.

[0085] Moreover, even if a control program is rewriting, about high processing of a priority, rewriting processing can be interrupted, this processing can be performed and rewriting processing can be rerun after the termination.

[0086] Therefore, according to this invention, it is upgradable suitably, working an image processing system efficiently.

[0087]

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the image processing system which rewrites the control program provided in an image processing system, and its approach, concerning an image processing system and its approach.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] PROM (programmable ROM) which can write in a program, and EPROM (erasable PROM) of an ultraviolet-rays elimination mold were used the mask ROM which wrote in fixed data (control program) in the production process from before as nonvolatile memory which stores the control program in an image processing system, and after manufacture. In recent years, EEPROM (electrically erasable and programmable ROM) which is rewritable nonvolatile memory electrically is developed as memory replaced with these, and using these also in an image processing system is proposed. By using the nonvolatile memory in which such rewriting is possible, it became possible easily for it to become unnecessary to perform ROM exchange in the case of correction of a control program and modification, and to rewrite this program on an onboard. Thereby, when it was the image processing system connected through the network, the control program could also be rewritten using the communication link from the remote place.

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, even if the control program of an image processing system is rewriting to the appearance explained above, about the function in which ***** actuation is possible, actuation can be continued as it is at it in actuation of this control program.

[0085] Moreover, even if a control program is rewriting, about high processing of a priority, rewriting processing can be interrupted, this processing can be performed and rewriting processing can be rerun after the termination.

[0086] Therefore, according to this invention, it is upgradable suitably, working an image processing system efficiently.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the image processing system which stored the control program in the rewritable nonvolatile memory mentioned above, when this control program was rewritten, this image processing system needed to stop the whole of the function. That is, since other processings were not able to be performed during rewriting actuation of memory, there was a problem that processing effectiveness will fall.

[0004] It is made in order that this invention may solve the technical problem mentioned above, and it aims at offering the image processing system which can perform a certain image processing, and its approach during rewriting actuation of a control program.

[Translation done.]

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MEANS

[Means for Solving the Problem] The image processing system of this invention is equipped with the following configurations as a way stage for attaining the purpose mentioned above.

[0006] That is, it is the image processing system which held for a storage means to by which a control program is rewritable, and it has the control means which controls the whole equipment according to said control program, and the rewriting means which rewrites said control program, said control means directs processing in which it can operate in the case of rewriting by said rewriting means, and it is characterized by to permit actuation of this processing in the case of rewriting by said rewriting means.

[0007] For example, it is characterized by said storage means containing a flash ROM.

[0008] For example, it is characterized by said storage means containing EEPROM.

[0009] For example, processing in which it can operate in the case of rewriting by said rewriting means is characterized by said control program being the processing which does not involve directly.

[0010] Furthermore, the storage means in which said rewriting is possible is characterized by processing in which it has the 2nd control program for the 2nd different storage means, and can operate in the case of rewriting by said rewriting means being processing by said 2nd control program.

[0011] For example, said 2nd storage means is characterized by the ability not to rewrite.

[0012] Furthermore, it has an information means to report a device status to an operator, and said information means is characterized by reporting the purport which is under rewriting in the case of rewriting by said rewriting means.

[0013] For example, said information means is characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.

[0014] Moreover, the control means which is the image processing system held for a storage means by which a control program is rewritable, and controls the whole equipment according to said control program, Have the rewriting means which rewrites said control program, and said storage means divides and holds said control program to two or more modules. Said rewriting means rewrites in said module unit, said control means directs processing in which it can operate in the case of rewriting by said rewriting means, from said two or more modules, and it is characterized by permitting actuation of this module in the case of rewriting by said rewriting means.

[0015] For example, said control means is characterized by interrupting said rewriting, when said directed module operates in the case of rewriting by said rewriting means.

[0016] For example, it is characterized by said storage means containing a flash ROM.

[0017] For example, it is characterized by said storage means containing EEPROM.

[0018] Furthermore, it has an information means to report a device status to an operator, and said information means is characterized by reporting the purport which is under rewriting in the case of rewriting by said rewriting means.

[0019] For example, said information means is characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.

[0020] The image-processing approach of this invention is equipped with the following processes

as a way method for attaining the purpose mentioned above.

[0021] That is, it is the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, and processing in which it can operate in case said control program is rewritten is directed, and it is characterized by permitting actuation of this processing in the case of rewriting.

[0022] Moreover, it is the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, and said storage means divides and holds said control program to two or more modules, processing in which it can operate in case said control program is rewritten in said module unit is directed from said two or more modules, and it is characterized by permitting actuation of this module in the case of rewriting.

[0023]

[Embodiment of the Invention] Hereafter, 1 operation gestalt concerning this invention is explained to a detail with reference to a drawing.

[0024] <1st operation gestalt> drawing 1 is the block diagram showing the configuration of the image processing system in this operation gestalt. In drawing 1, 10 is an image processing system, 11 is external devices, such as a host computer, and the predetermined interface connects mutually. Moreover, for 1, as for the printer section and 3, in an image processing system 10, the reader section and 2 are [the facsimile section and 4] hard disks.

[0025] Hereafter, the actuation in the above-mentioned configuration is explained. First, the reader section 1 reads optically the image of the manuscript laid in the non-illustrated manuscript base, and outputs the image data according to a manuscript image to the printer section 2 and the facsimile section 3. In addition, in the image processing system 10 of this operation gestalt, it shall have the memory set as the rewriting object of the program mentioned later in the reader section 1. The printer section 2 records the image according to the image data inputted through the reader section 1 and the facsimile section 3 on a record medium. The facsimile section 3 compresses the image data to which the so-called reception which is connected to the reader section 1, elongates the compression image data which received through the dial-up line, and transmits the this elongated image data to the reader section 1 was performed, and the facsimile section 3 has been transmitted from the reader section 1, and transmits the this compressed image data to the phase hand set up through the dial-up line. The hard disk 4 is connected to the facsimile section 3, and the compression image data which received can be saved temporarily. Moreover, an external device 11 is a host computer, and as it is mentioned later, it rewrites memory in the reader section 1.

[0026] Hereafter, the reader section 1 and the printer section 2 are explained to a detail. In this operation gestalt, it has the reader section 1 and the printer section 2 as equipment of one, and the sectional side elevation is shown in drawing 2. In the reader section 1, 101 is a manuscript feeding device, feeds up to platen glass 102 with one manuscript at a time sequentially from the last page, and discharges the manuscript on platen glass 102 after reading actuation termination of a manuscript. If a manuscript is conveyed on platen glass 102, a lamp 103 will light up and the exposure scan of the manuscript will be carried out by starting migration of the scanner unit 104. The reflected light from the manuscript at this time is led to CCD series (Following CCD is called) 109 with a mirror 105, 106, 107 and a lens 108. Thus, the image data of the manuscript scanned on platen glass 102 is read by CCD 109. The image data outputted from CCD 109 is transmitted to the printer section 2 or the facsimile section 3, after a predetermined image processing is performed.

[0027] 221 is a laser driver, drives the laser light-emitting part 201, and makes the laser beam according to the image data outputted from the reader section 1 emit light in the printer section 2. This laser beam is irradiated by the photoconductor drum 202, and the latent image according to a laser beam is processed by the photoconductor drum 202. The part of the latent image of this photoconductor drum 202 adheres to a developer with a development counter 203. And to the timing which synchronized with exposure initiation of a laser beam, paper is fed to the recording paper from either a cassette 204 and the cassette 205, it conveys to the imprint section 206, and the developer to which the photoconductor drum 202 adhered is imprinted on this recording paper. The recording paper with which the developer got is conveyed by the fixing

section 207, and the recording paper is fixed to a developer by being heated and pressurized. The recording paper which passed the fixing section 207 is discharged with the discharge roller 208. By containing the discharged detail paper into each bottle, a sorter 220 classifies the detail paper. In addition, when the classification in a sorter 220 is not set up, the recording paper is contained into the best bottle. Moreover, when double-sided record is set up, after even the discharge roller 208 conveys the recording paper, the hand of cut of the discharge roller 208 is reversed, and the recording paper is led to a re-feeding conveyance way by the flapper 209. Moreover, when multiplex record is set up, it leads to a re-feeding conveyance way by the flapper 209 so that even the discharge roller 208 may not convey the recording paper. The recording paper led to the re-feeding conveyance way is fed to the imprint section 206 to the timing mentioned above.

[0028] The detail block configuration of the reader section 1 is shown in drawing 3. In drawing 3, the A/D-SH section in which 109 performs CCD and 110 performs A/D conversion and a shading compensation, the image-processing section in which 111 performs various image processings, the I/F section in which 113 manages an interface with the facsimile section 3, the control unit to which, as for 115, directions input, condition information of equipment, etc. are performed by the operator, and 117 are the I/F sections which manage an interface with an external device 11, and it has SCSI, RS-232C, etc.

[0029] 114 is CPU which controls each configuration of the reader section 1 in generalization, and 116 is the memory which stored the control program referred to and performed by CPU114. Memory 116 is constituted by EEPROM etc., is rewritten in this operation gestalt, and is the target memory.

[0030] As for the image data outputted from CCD109, a shading compensation is performed while analog-to-digital conversion is performed in the A/D-SH section 110. The image data processed by the A/D-SH section 110 is transmitted to the facsimile section 3 through the I/F section 113 while it is transmitted to the printer section 2 through the image-processing section 111. CPU114 controls the image-processing section 111 and the I/F section 113 according to the contents of a setting set up by the control unit 115. For example, after making trimming processing perform in the image-processing section 111, it is made to transmit to the printer section 2, when the copy mode which copies by performing trimming processing by the control unit 115 is set up. Moreover, when the facsimile transmitting mode is set up by the control unit 115, the control command according to image data and the set-up mode is made to transmit to the facsimile section 3 from the I/F section 113. The control program of CPU114 which performs such processing like mentioned above is memorized by memory 116. Moreover, memory 116 is used also as a working area of CPU114.

[0031] Next, the detail configuration of memory 116 is explained. Drawing 4 is the block diagram showing the configuration of the memory 116 shown in drawing 3. Memory 116 is constituted by a flash ROM 1161, and EPROM1162 and RAM1163 in drawing 4. Moreover, 118 and 119 are the address buses and data buses of CPU114, respectively. A flash ROM 1161 is rewritable nonvolatile memory which has memorized the control program for the normal operation of the reader section 1, and consists of an EEPROM etc. EPROM1162 has memorized the download program at the time of rewriting a flash ROM 1161. Moreover, RAM1163 is used as the backup data storage of the reader section 1, and a working area of CPU114.

[0032] Hereafter, the actuation in the case of performing the so-called version up processing which rewrites the control program of the reader section 1 by the external device 11 in the image processing system 10 of a configuration as mentioned above is considered. At this time, an external device 11 is a host computer and transmits the control program memorized in the flash ROM 1161 shown in drawing 4 through the interface 117 of RS-232C to an image processing system 10 side. Then, CPU114 makes a flash ROM 1161 memorize the received control program, referring to the download program memorized by EPROM1162.

[0033] In this case, the flash ROM 1161 is rewriting mode and cannot perform the usual read-out actuation. Therefore, in the reader section 1, it will be in the condition that normal operation cannot be performed. Then, in this operation gestalt, in case a flash ROM 1161 is rewritten, that is notified to the printer section 2 and the facsimile section 3. And in the printer section 2 and

the facsimile section 3, the whole of the actuation is stopped about the module which cannot operate if the reader section 1 is not operating, and even if the reader section 1 is not operating, about the module which can operate, actuation is continued as it is. For example, in this operation gestalt, only the function to save the compression image data which received through the dial-up line in the facsimile section 3 at a hard disk 4 enables ***** actuation in the condition of the reader section 1.

[0034] Here, the detail configuration of the facsimile section 3 is shown in the block diagram of drawing 5. In drawing 5, 31 is CPU which controls actuation of the facsimile section 3, and 32 is the memory holding the control program in the facsimile section 3. It is the nonvolatile memory which is not rewritable (mask ROM etc.), and memory 32 is equipped with the receiving module and the transmitting module as a control program. 33 and 35 are the I/F sections which take an interface with communications-partner equipment and the reader section 1, respectively, and 34 is the image-processing section which performs elongation processing of a receiving image, compression processing of a transmitting image, etc. In addition, it is elongated in the image-processing section 34, and the image data received through I/F33 in the facsimile section 3 is stored in a hard disk 4.

[0035] The flow chart shown in drawing 6 is referred to hereafter, and the detail of actuation of the reader section 1 at the time of memory rewriting activation of this operation gestalt is explained. The program which the processing shown in the flow chart of drawing 6 shows the processing at the time of downloading the flash ROM 1161 of the reader section 1, and realizes this processing is beforehand memorized by EPROM1162 as a download program. This download program is started by rewriting from an external device 11 and receiving the command of activation, and is executed by CPU114.

[0036] If the reader section 1 rewrites from the host computer of an external device 11 and receives the command of activation, it will wait to be judged, and to become return and rewritable at step S101, if it is not rewritable whether a control program is rewritable in step S101 first. Here, the case where current copy processing, the facsimile transmission / reception of an image processing system 10, etc. are working, it is intermediate states, such as a paper jam and those without paper, as a condition which is not rewritable, or they are some abnormal conditions, such as abnormality heating of a heating roller, can be considered.

[0037] Progressing to step S102 at step S101, if a control program is rewritable, CPU114 transmits the rewriting initiation command which shows that rewriting of a control program was started to the printer section 2 and the facsimile section 3. At this time, even if a control program is rewriting CPU114, it adds the information on the function in which it can operate, as functional information to the rewriting initiation command to transmit.

[0038] In the reader section 1, it has the list of a module which operates in the facsimile section 3 in memory 116. That is, it has the information about the receiving module and transmitting module in the facsimile section 3. In addition, CPU114 may be made to ask the module in memory 32 to CPU31 of the facsimile section 3.

[0039] Thus, in case it rewrites in step S102 and an initiation command is transmitted, the module which can operate in the facsimile section 3 can be judged. For example, what is necessary is just to form the flag which shows whether it can operate at the time of rewriting in the module list of operation in memory 116. In the receiving module in the facsimile section 3, since the received signal is stored in a hard disk 4, even if the memory 116 in the reader section 1 rewrites this and it is inside, it can operate, but by the transmitting module, since the reader section 1 needs to generate a sending signal, it cannot operate during rewriting.

[0040] And it progresses to step S103, and CPU114 is rewritten and displays the operating state under activation on a control unit 115. In this operation gestalt, the purport in which the display of the purport which is [rewriting] under activation and the auto-receipt of facsimile are possible is displayed.

[0041] Then, it progresses to step S104 and rewriting of a control program is performed to a flash ROM 1161. At this time, only the function (receiving module in the facsimile section 3) shown using the functional information which rewrote at step S102 and was added to the initiation command can operate. That is, during rewriting activation, it is possible to save the

compression image data which received through the telephone line in the facsimile section 3 at a hard disk 4.

[0042] After rewriting of a flash ROM 1161 is completed, it progresses to step S105, and the rewriting quit command which shows that rewriting of a control program ended CPU114 in the printer section 2 and the facsimile section 3 is transmitted.

[0043] Then, it progresses to step S106, and CPU114 displays the purport in which normal operation is possible on a control unit 115, and returns to normal operation after that. For example, in this operation gestalt, if reception was performed in the facsimile section 3 during rewriting activation, the received data stored in the hard disk 4 will be outputted from the printer section 2.

[0044] In addition, when the function of an image processing system 10 changes a lot by rewriting of a control program, once turning OFF the body power source of an image processing system 10, reboot may be applied by setting to ON again. In this case, in step S106, a display to that effect is performed to a control unit 115, and reboot is demanded from an operator.

[0045] Next, the flow chart shown in drawing 7 is referred to, and actuation of the facsimile section 3 at the time of memory rewriting activation is explained to a detail.

[0046] The processing shown in the flow chart of drawing 7 shows the processing in the FAKURIMIRI section 3 at the time of downloading the flash ROM 1161 of the reader section 1. The program which realizes this processing is held at ROM which is not illustrated in the facsimile section 3, and is started by rewriting from CPU114 and receiving an initiation command.

[0047] The module (receiving module) which can operate is chosen from the functional information to which the facsimile section 3 rewrites from the reader section 1, and receives an initiation command, which it was not rich and was received in step S201 and which rewrites and is added to the initiation command in the facsimile section 3. Next, it progresses to step S202 and the facsimile section 3 is changed into the condition that only the module which can operate can be performed. And it judges whether it progressed to step S203, and rewrote from the reader section 1, and the quit command was received. Actuation of only the module in step S202 which can be operated is continued until it receives return and a rewriting quit command to step S202, if it has not received. If it rewrites in step S203 and a quit command is received, it will progress to step S204, and it returns to the usual actuation.

[0048] In addition, in this operation gestalt, it explained for being only a receiving module in the FAKURIMIRI section 3 as a module which can operate during rewriting of a control program, but if it is the function which does not need the direct control by the reader section 1, not only the facsimile section 3 but this invention is applicable.

[0049] According to this operation gestalt, even if the control program of an image processing system is rewriting to the appearance explained above, about the function in which ***** actuation is possible, actuation can be continued as it is at it in actuation of this control program. Therefore, it is upgradable suitably, working an image processing system efficiently.

[0050] The 2nd operation gestalt concerning this invention is explained below the <2nd operation gestalt>.

[0051] Drawing 8 is the block diagram showing the configuration of the image processing system in the 2nd operation gestalt. In drawing 8, 51 is the reader section, reads the manuscript image laid in the non-illustrated manuscript base, and outputs the image data according to this manuscript image to the printer section 52 and image I/O control unit 53. The printer section 52 records and outputs the image according to the image data transmitted from the reader section 51 and image I/O control unit 53 in the record paper. It connects with the reader section 51 and image I/O control unit 53 consists of the facsimile section 54, the file section 55, the computer interface section 57, the formatter section 58, the image memory section 59, and core section 60 grade.

[0052] The facsimile section 54 elongates the compression image data which received through the dial-up line, and transmits the this elongated image data to the core section 60. Moreover, it is transmitted from the core section 60, image data is compressed, and the this compressed image data is transmitted to the destination specified through the dial-up line. The hard disk 62

is connected to the facsimile section 54, and the compression image data which received can be saved temporarily.

[0053] The Magnetic-Optical disk drive unit 56 is connected to the file section 55. The file section 55 compresses the image data transmitted from the core section 60, and is made to memorize it with the keyword for searching this image data to the removable magneto-optic disk set to the Magnetic-Optical disk drive unit 56. Moreover, the file section 55 searches the compression image data memorized by the magneto-optic disk based on the keyword transmitted through the core section 60. And the searched compression image data is read, it elongates, and the this elongated image data is transmitted to the core section 60.

[0054] The computer interface section 57 is a part which manages the interface between a personal computer or a workstation (PC/WS) 61, and the core section 60. The formatter section 58 develops expression grinding code data for the image transmitted from PC/WS61 to the image data of a format recordable in the printer section 52. The image memory section 59 memorizes temporarily the data transmitted from PC/WS61.

[0055] In addition, although later mentioned about the detail of the core section 60, the core section 60 controls the data flow between each of the reader section 51, the facsimile section 54, the file section 55, the computer interface section 57, the formatter section 58, and the image memory section 59. Moreover, in the 2nd operation gestalt, memory in the reader section 51 shall be rewritten by using an external device 63 as a host computer.

[0056] In addition, although it has the reader section 1 and the printer section 2 as equipment of one in the 2nd operation gestalt, since the sectional side elevation is the same as that of drawing 2 shown in the 1st operation gestalt mentioned above, explanation is omitted.

[0057] The detail block configuration of the reader section 51 is shown in drawing 9. In drawing 9, the A/D-SH section in which 159 performs CCD and 150 performs A/D conversion and a shading compensation, the image-processing section in which 151 performs various image processings, the I/F section in which 153 manages an interface with image I/O control unit 53, the control unit to which, as for 155, directions input, condition information of equipment, etc. are performed by the operator, and 157 are the I/F sections which manage an interface with an external device 11, and it has SCSI, RS-232C, etc.

[0058] 154 is CPU which controls each configuration of the reader section 51 in generalization, and 156 is the memory which stored the control program referred to and performed by CPU154. Memory 156 is constituted by EEPROM etc., is rewritten in this operation gestalt, and is the target memory.

[0059] As for the image data outputted from CCD159, a shading compensation is performed while analog-to-digital conversion is performed in the A/D-SH section 150. The image data processed by the A/D-SH section 150 is transmitted to the core section 60 of image I/O control unit 53 through the I/F section 153 while it is transmitted to the printer section 2 through the image-processing section 151. CPU154 controls the image-processing section 151 and the I/F section 153 according to the contents of a setting set up by the control unit 155. For example, after making trimming processing perform in the image-processing section 151, it is made to transmit to the printer section 2, when the copy mode which copies by performing trimming processing by the control unit 155 is set up. Moreover, when the facsimile transmitting mode is set up by the control unit 155, the control command according to image data and the set-up mode is made to transmit to the core section 60 from the I/F section 153. The control program of CPU154 which performs such processing like mentioned above is memorized by memory 156. Moreover, memory 156 is used also as a working area of CPU154.

[0060] The detail block configuration of the core section 60 is shown in drawing 10. The I/F section in which 120 takes an interface with other configurations in image I/O control unit 53, the data-processing section in which 121 performs an image processing, the I/F section in which 122 takes an interface with the reader section 51, CPU by which 123 controls the core section 60 whole, and 124 are the memory which stored the control program performed by CPU123 [in the core section 60].

[0061] The image data and control command which have been transmitted from the reader section 51 are inputted into the data-processing section 121 and CPU123, respectively. Image

processings, such as rotation and variable power, are performed in the data-processing section 121, and the transmitted image data is transmitted through the I/F section 120 according to the contents of control command to the facsimile section 54, the file section 55, or the computer interface section 57.

[0062] Moreover, after the code data showing an image inputted through the computer interface 57 are transmitted to the data-processing section 121, they are transmitted to the formatter section 58. And after being developed by image data in the formatter section 58, this image data is transmitted to the data-processing section 121, and is transmitted to the facsimile section 54 or the printer section 52.

[0063] After the image data from the facsimile section 54 is transmitted to the data-processing section 121, it is transmitted to the printer section 52, the file section 55, or the computer interface section 57. Moreover, after the image data from the file section 55 is transmitted to the data-processing section 121, it is transmitted to the printer section 52, the facsimile section 54, and the computer interface section 57.

[0064] CPU123 performs control which was mentioned above according to the control program memorized by memory 124 and the control command transmitted from the reader section 51. In addition, memory 124 is used also as a working area of CPU123.

[0065] It is possible to perform processing which was explained above and which compounded [in / like / the image processing system of the 2nd operation gestalt] functions, such as reading of a manuscript image, a print of an image, transmission and reception of an image, preservation of an image, and I/O of the data from a computer, focusing on the core section 60.

[0066] Next, the detail configuration of the memory 156 in the reader section 51 is explained.

Drawing 11 is the block diagram showing the configuration of the memory 156 shown in drawing 9. Memory 156 is constituted by a flash ROM 1561 and RAM1562 in drawing 11. Moreover, 158 and 159 are the address buses and data buses of CPU154, respectively. The flash ROM 1561 has memorized the control program for the normal operation of the reader section 51, and is the rewritable nonvolatile memory of EEPROM etc. Moreover, RAM1563 is used as the backup data storage of the reader section 51, and a working area of CPU154.

[0067] The internal configuration of a flash ROM 1561 is shown in drawing 12 here. As shown in drawing 12, a flash ROM 1561 is divided into 16 blocks shown by 1100-1115, and the module according to individual is stored for every block. In case a flash ROM 1561 rewrites, although it rewrites and becomes the mode, it is the thing which cannot perform the usual read-out actuation and for which rewriting is interrupted temporarily, and the read-out actuation of it is attained. Moreover, a flash ROM 1561 is rewritable in this block unit.

[0068] In the flash ROM 1561 shown in drawing 12, in case a flash ROM 1561 is rewritten for block 1100, the download program referred to by CPU154 is memorized, and in order that only this block may forbid rewriting, it is protected in hard. In case it rewrites to other blocks, CPU154 controls transmitting the download program memorized by the block 1100 to RAM1562, and referring to the this transmitted program. Moreover, block 1101 to the block 1107 has memorized the control program about the reader section 51. Moreover, block 1108 to the block 1112 has memorized the program of each control unit, and makes block 1115 a reserve field from block 1113.

[0069] In the image processing system of the 2nd operation gestalt which makes hereafter a configuration which was mentioned above, the actuation in the case of performing the so-called version up processing which rewrites the control program of the reader section 51 by the external device 63 is considered. At this time, an external device 63 is a host computer and transmits the control program memorized in the flash ROM 1561 shown in drawing 11 through the interface 157 of RS-232C to an image processing system side. Then, CPU154 makes a flash ROM 1561 memorize the received control program, referring to the download program transmitted to RAM1562.

[0070] Although the time of rewriting mode becomes impossible as for the usual read-out, read-out of the flash ROM 1561 in the 2nd operation gestalt becomes possible by interrupting rewriting temporarily. Then, in the 2nd operation gestalt, in case a flash ROM 1561 is rewritten, the following control is performed.

[0071] That is, about the module which can be performed combining the program within a block unrelated to the block to rewrite, read-out is made possible. And when a run command occurs to the module which can be performed at the time of rewriting mode, after interrupting rewriting temporarily, performing preferentially actuation to the module which can be performed and completing this actuation, it rewrites again. For example, considering the case where rewriting for adding the function in the file manipulation section shown especially in the block 1111 of drawing 12 to the control program in a flash ROM 1561 is performed, performing the usual processing in this case about each control unit (it corresponding to blocks 1109, 1110, and 1112, respectively) of a copy, facsimile, and a printer is permitted.

[0072] Next, the flow chart shown in drawing 13 is referred to, and actuation of the reader section 51 at the time of memory rewriting activation is explained to a detail. The program which the processing shown in the flow chart of drawing 13 shows the processing at the time of downloading the flash ROM 1561 of the reader section 51, and realizes this processing is beforehand memorized by the block 1100 of a flash ROM 1561. By rewriting from an external device 11 and receiving the command of activation, this download program is transmitted to RAM1562, and is executed by CPU154.

[0073] If the reader section 51 rewrites from the host computer of an external device 11 and receives the command of activation, it will wait to be judged, and to become return and rewritable at step S301, if it is not rewritable whether a control program is rewritable in step S301 first. Here, the case where current copy processing, the facsimile transmission / reception of an image processing system 10, etc. are working, it is intermediate states, such as a paper jam and those without paper, as a condition which is not rewritable, or they are some abnormal conditions, such as abnormality heating of a heating roller, can be considered.

[0074] Progressing to step S302 at step S301, if a control program is rewritable, CPU154 stops all the functions about the module within the block which is a candidate for rewriting. For example, as mentioned above, when rewriting to the file manipulation module shown in block 1111 is performed, CPU154 displays the purport whose file manipulation becomes impossible from this on a control unit 155, and publishes the command which shows that the file section 55 is invalid to image I/O control unit 53. In addition, in a control unit 155, all displays about file manipulation may be suspended at this time.

[0075] Next, it progresses to step S303 and an image processing system shifts to rewriting mode. And in step S304, rewriting of a control program (in this case, only block 1111) is performed to a flash ROM 1561.

[0076] And after rewriting of a flash ROM 1561 is completed, it progresses to step S305 and rewriting mode is ended. Then, in step S306, the module stopped at step S302 for rewriting is rebooted.

[0077] Although memory rewriting processing in the 2nd operation gestalt is performed as it explained above, in the 2nd operation gestalt, it is characterized by the thing which were mentioned above and for which other actuation is given priority to and performed during memory rewriting like. Hereafter, the interruption interruption processing under rewriting processing is explained with reference to the flow chart of drawing 14.

[0078] Suppose [be / it / under / rewriting processing activation / which is shown in step S304 of drawing 13 mentioned above / setting] that interruption of the activation demand to a certain module which can be operated was received. For example, the print run command to the module in the printer control unit of the block 1112 shown in drawing 12 etc. corresponds to this interrupt request. Then, CPU154 starts interruption interruption processing. First, in step S311, it is interrupted temporarily and CPU154 changes rewriting to the block 1111 of a flash ROM 1561 into the condition which can read a flash ROM 1561.

[0079] Next, it progresses to step S312 and the module with an operational request which can be operated is performed. And if actuation of this module is completed, it will progress to step S313, and it judges whether there is any operational request interruption to other modules which can be operated. When there is interruption to other modules, processing returns to step S312 and performs the module concerned.

[0080] On the other hand, if other interruption cannot be found in step S313, it will progress to

step S314, and momentary interruption of the rewriting processing by step S311 is canceled, and it changes into the condition that a flash ROM 1561 is rewritable.

[0081] And return and rewriting processing can be resumed to step S304 shown in drawing 13 .

[0082] Even if the control program of an image processing system is rewriting to the appearance explained above according to the 2nd operation gestalt, about high processing of a priority, rewriting processing can be interrupted to it, this processing can be performed, and rewriting processing can be rerun after the termination. Therefore, it is upgradable suitably, working an image processing system efficiently.

[0083] Moreover, even if it applies this invention to the system which consists of two or more devices, such as a host computer, an interface, and a printer, it may be applied to the equipment which consists of one devices, such as a copying machine. Moreover, it cannot be overemphasized that this invention can be applied also when carrying out by supplying a program to a system or equipment. In this case, the storage which stored the program concerning this invention will constitute this invention. And the system or equipment operates by the method defined beforehand by reading the program from this storage to a system or equipment.

[Translation done.]

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the configuration of the image processing system in 1 operation gestalt concerning this invention.

[Drawing 2] It is the sectional side elevation of the equipment which made one the reader section 1 and the printer section 2 in this operation gestalt.

[Drawing 3] It is the block diagram showing the configuration of the reader section 1 of this operation gestalt.

[Drawing 4] It is the block diagram showing the detail configuration of the memory 116 of this operation gestalt.

[Drawing 5] It is the block diagram showing the configuration of the facsimile section 3 of this operation gestalt.

[Drawing 6] It is the flow chart which shows the processing which rewrites the control program in the reader section 1 in this operation gestalt.

[Drawing 7] It is the flow chart which shows actuation of the facsimile section 3 at the time of rewriting a control program in this operation gestalt.

[Drawing 8] It is the block diagram showing the configuration of the image processing system in the 2nd operation gestalt concerning this invention.

[Drawing 9] It is the block diagram showing the configuration of the reader section 51 in the 2nd operation gestalt.

[Drawing 10] It is the block diagram showing the configuration of the core section 60 in the 2nd operation gestalt.

[Drawing 11] It is the block diagram showing the detail configuration of the memory 156 in the 2nd operation gestalt.

[Drawing 12] It is drawing showing the memory configuration of the flash ROM 1561 in the 2nd operation gestalt.

[Drawing 13] It is the flow chart which shows the processing which rewrites the control program in the reader section 1 in the 2nd operation gestalt.

[Drawing 14] It is the flow chart which shows interrupt processing at the time of rewriting a control program in the 2nd operation gestalt.

[Description of Notations]

- 1 Reader Section
- 2 Printer Section
- 3 Facsimile Section
- 4 Hard Disk
- 11 External Device
- 111 Image-Processing Section
- 114 CPU
- 115 Control Unit
- 116 Memory
- 1161 Flash ROM
- 1162 EPROM

1163 RAM

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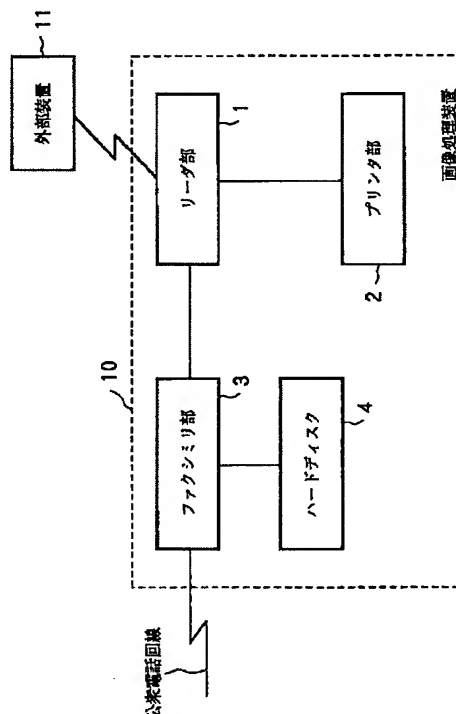
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(54) 【発明の名称】 画像処理装置及びその方法

(57) 【要約】

【課題】 制御プログラムの書き換え動作中においても、何らかの画像処理を実行可能な画像処理装置及びその方法を提供することを目的とする。

【解決手段】 リーダ部1内のCPUはファクシミリ部3における受信モジュールはリーダ部1の制御プログラムが書き換え中であっても動作可能であると判断し、実際の書き換え時にファクシミリ部3へ書き換え開始コマンドと共に動作可能モジュール情報を送信する。ファクシミリ部3では該情報に従って、リーダ部1の制御プログラムの書き換え中であっても、受信モジュールのみを通常動作させる。



【特許請求の範囲】

【請求項 1】 制御プログラムを書き換え可能な記憶手段に保持した画像処理装置であって、前記制御プログラムに従って装置全体を制御する制御手段と、

前記制御プログラムを書き換える書き換え手段とを有し、

前記制御手段は、前記書き換え手段による書き換えの際に動作可能な処理を指示し、前記書き換え手段による書き換えの際に該処理の動作を許可することを特徴とする画像処理装置。

【請求項 2】 前記記憶手段はフラッシュROMを含むことを特徴とする請求項 1 記載の画像処理装置。

【請求項 3】 前記記憶手段はEEPROMを含むことを特徴とする請求項 2 記載の画像処理装置。

【請求項 4】 前記書き換え手段による書き換えの際に動作可能な処理は、前記制御プログラムが直接関与しない処理であることを特徴とする請求項 1 記載の画像処理装置。

【請求項 5】 更に、前記書き換え可能な記憶手段とは異なる第 2 の記憶手段に第 2 の制御プログラムを有し、前記書き換え手段による書き換えの際に動作可能な処理は、前記第 2 の制御プログラムによる処理であることを特徴とする請求項 4 記載の画像処理装置。

【請求項 6】 前記第 2 の記憶手段は書き換え不可能であることを特徴とする請求項 5 記載の画像処理装置。

【請求項 7】 更に、操作者に装置状態を報知する報知手段を有し、

前記報知手段は、前記書き換え手段による書き換えの際に、書き換え中である旨を報知することを特徴とする請求項 1 記載の画像処理装置。

【請求項 8】 前記報知手段は、前記書き換え手段による書き換えの際に、動作可能な処理を報知することを特徴とする請求項 7 記載の画像処理装置。

【請求項 9】 制御プログラムを書き換え可能な記憶手段に保持した画像処理装置であって、

前記制御プログラムに従って装置全体を制御する制御手段と、

前記制御プログラムを書き換える書き換え手段とを有し、

前記記憶手段は前記制御プログラムを複数のモジュールに分割して保持し、

前記書き換え手段は前記モジュール単位で書き換えを行い、

前記制御手段は、前記書き換え手段による書き換えの際に動作可能な処理を前記複数のモジュールから指示し、前記書き換え手段による書き換えの際に該モジュールの動作を許可することを特徴とする画像処理装置。

【請求項 10】 前記制御手段は、前記書き換え手段による書き換えの際に前記指示されたモジュールが動作す

る場合、前記書き換えを中断することを特徴とする請求項 9 記載の画像処理装置。

【請求項 11】 前記記憶手段はフラッシュROMを含むことを特徴とする請求項 9 記載の画像処理装置。

【請求項 12】 前記記憶手段はEEPROMを含むことを特徴とする請求項 11 記載の画像処理装置。

【請求項 13】 更に、操作者に装置状態を報知する報知手段を有し、

前記報知手段は、前記書き換え手段による書き換えの際に、書き換え中である旨を報知することを特徴とする請求項 9 記載の画像処理装置。

【請求項 14】 前記報知手段は、前記書き換え手段による書き換えの際に、動作可能な処理を報知することを特徴とする請求項 13 記載の画像処理装置。

【請求項 15】 制御プログラムを書き換え可能な記憶手段に保持した画像処理装置における画像処理方法であって、

前記制御プログラムを書き換える際に動作可能な処理を指示し、書き換えの際に該処理の動作を許可することを特徴とする画像処理方法。

【請求項 16】 制御プログラムを書き換え可能な記憶手段に保持した画像処理装置における画像処理方法であって、

前記記憶手段は前記制御プログラムを複数のモジュールに分割して保持し、

前記制御プログラムを前記モジュール単位で書き換える際に動作可能な処理を前記複数のモジュールから指示し、

書き換えの際に該モジュールの動作を許可することを特徴とする画像処理方法。

【発明の詳細な説明】**【0001】**

【発明の属する技術分野】 本発明は画像処理装置及びその方法に関し、例えば、画像処理装置内に具備された制御プログラムの書き換えを行う画像処理装置及びその方法に関する。

【0002】

【従来の技術】 従来より、画像処理装置における制御プログラムを格納する不揮発性メモリとして、製造工程において固定データ（制御プログラム）を書き込んだマスクROMや、製造後にプログラムの書き込みが可能なPROM (programmable ROM) や紫外線消去型のEPROM (erasable PROM) が使用されていた。近年、これらに代わるメモリとして、電気的に書き換え可能な不揮発性メモリであるEEPROM (electrically erasable and programmable ROM) 等が開発され、画像処理装置においてもこれらを用いることが提案されている。このような書き換え可能な不揮発性メモリを用いることにより、制御プログラムの修正、変更の際にROM交換を行う必要がなくなり、オンボード上で該プログラムの書き換えを行うことが容易に可能となった。これにより、ネットワー

クを介して接続された画像処理装置であれば、遠隔地から通信を用いて制御プログラムを書き換えることもできるようになった。

【0003】

【発明が解決しようとする課題】しかしながら、上述した書き換え可能な不揮発性メモリに制御プログラムを格納した画像処理装置において、該制御プログラムの書き換えを行う場合には、該画像処理装置はその機能を全て停止しておく必要があった。即ち、メモリの書き換え動作中においては他の処理が行えないため、処理効率が低下してしまうという問題があった。

【0004】本発明は上述した課題を解決するためになされたものであり、制御プログラムの書き換え動作中においても、何らかの画像処理を実行可能な画像処理装置及びその方法を提供することを目的とする。

【0005】

【課題を解決するための手段】上述した目的を達成するための一手段として、本発明の画像処理装置は以下の構成を備える。

【0006】即ち、制御プログラムを書き換え可能な記憶手段に保持した画像処理装置であって、前記制御プログラムに従って装置全体を制御する制御手段と、前記制御プログラムを書き換える書き換え手段とを有し、前記制御手段は、前記書き換え手段による書き換えの際に動作可能な処理を指示し、前記書き換え手段による書き換えの際に該処理の動作を許可することを特徴とする。

【0007】例えば、前記記憶手段はフラッシュROMを含むことを特徴とする。

【0008】例えば、前記記憶手段はEEPROMを含むことを特徴とする。

【0009】例えば、前記書き換え手段による書き換えの際に動作可能な処理は、前記制御プログラムが直接関与しない処理であることを特徴とする。

【0010】更に、前記書き換え可能な記憶手段とは異なる第2の記憶手段に第2の制御プログラムを有し、前記書き換え手段による書き換えの際に動作可能な処理は、前記第2の制御プログラムによる処理であることを特徴とする。

【0011】例えば、前記第2の記憶手段は書き換え不可能であることを特徴とする。

【0012】更に、操作者に装置状態を報知する報知手段を有し、前記報知手段は、前記書き換え手段による書き換えの際に、書き換え中である旨を報知することを特徴とする。

【0013】例えば、前記報知手段は、前記書き換え手段による書き換えの際に、動作可能な処理を報知することを特徴とする。

【0014】また、制御プログラムを書き換え可能な記憶手段に保持した画像処理装置であって、前記制御プログラムに従って装置全体を制御する制御手段と、前記制

御プログラムを書き換える書き換え手段とを有し、前記記憶手段は前記制御プログラムを複数のモジュールに分割して保持し、前記書き換え手段は前記モジュール単位で書き換えを行い、前記制御手段は、前記書き換え手段による書き換えの際に動作可能な処理を前記複数のモジュールから指示し、前記書き換え手段による書き換えの際に該モジュールの動作を許可することを特徴とする。

【0015】例えば、前記制御手段は、前記書き換え手段による書き換えの際に前記指示されたモジュールが動作する場合、前記書き換えを中断することを特徴とする。

【0016】例えば、前記記憶手段はフラッシュROMを含むことを特徴とする。

【0017】例えば、前記記憶手段はEEPROMを含むことを特徴とする。

【0018】更に、操作者に装置状態を報知する報知手段を有し、前記報知手段は、前記書き換え手段による書き換えの際に、書き換え中である旨を報知することを特徴とする。

【0019】例えば、前記報知手段は、前記書き換え手段による書き換えの際に、動作可能な処理を報知することを特徴とする。

【0020】上述した目的を達成するための一手法として、本発明の画像処理方法は以下の工程を備える。

【0021】即ち、制御プログラムを書き換え可能な記憶手段に保持した画像処理装置における画像処理方法であって、前記制御プログラムを書き換える際に動作可能な処理を指示し、書き換えの際に該処理の動作を許可することを特徴とする。

【0022】また、制御プログラムを書き換え可能な記憶手段に保持した画像処理装置における画像処理方法であって、前記記憶手段は前記制御プログラムを複数のモジュールに分割して保持し、前記制御プログラムを前記モジュール単位で書き換える際に動作可能な処理を前記複数のモジュールから指示し、書き換えの際に該モジュールの動作を許可することを特徴とする。

【0023】

【発明の実施の形態】以下、本発明に係る一実施形態について、図面を参照して詳細に説明する。

【0024】＜第1実施形態＞図1は本実施形態における画像処理装置の構成を示すブロック図である。図1において、10は画像処理装置、11はホストコンピュータ等の外部装置であり、所定のインタフェースにより互いに接続されている。また、画像処理装置10において、1はリーダ部、2はプリンタ部、3はファクシミリ部、4はハードディスクである。

【0025】以下、上記構成における動作について説明する。まず、リーダ部1は不図示の原稿台上に載置された原稿の画像を光学的に読み取り、原稿画像に応じた画像データをプリンタ部2及びファクシミリ部3へ出力す

る。尚、本実施形態の画像処理装置10において、後述するプログラムの書き換え対象となるメモリはリーダ部1内に備えられているものとする。プリンタ部2は、リーダ部1及びファクシミリ部3を介して入力された画像データに応じた画像を、記録媒体上に記録する。ファクシミリ部3はリーダ部1に接続されており、公衆電話回線を介して受信した圧縮画像データを伸長し、該伸長した画像データをリーダ部1へ転送する、所謂受信処理を行う。又、ファクシミリ部3は、リーダ部1から転送されてきた画像データを圧縮し、該圧縮した画像データを公衆電話回線を介して設定された相手先へ送信する。ファクシミリ部3にはハードディスク4が接続されており、受信した圧縮画像データを一時的に保存することができる。また、外部装置11は例えばホストコンピュータであり、後述する様にしてリーダ部1内のメモリの書き換えを行う。

【0026】以下、リーダ部1及びプリンタ部2について詳細に説明する。本実施形態においてはリーダ部1及びプリンタ部2を一体の装置として備えており、図2にその側断面図を示す。リーダ部1において、101は原稿給送装置であり、原稿を最終頁から順に1枚ずつプラテンガラス102上へ給送し、原稿の読み取り動作終了後、プラテンガラス102上の原稿を排出するものである。原稿がプラテンガラス102上に搬送されると、ランプ103が点灯し、スキャナユニット104の移動が開始されることにより、原稿が露光走査される。この時の原稿からの反射光は、ミラー105、106、107、及びレンズ108によってCCDイメージセンサ（以下CCDと称する）109へ導かれる。このようにして、プラテンガラス102上で走査された原稿の画像データは、CCD109によって読み取られる。CCD109から出力される画像データは、所定の画像処理が施された後、プリンタ部2又はファクシミリ部3へ転送される。

【0027】プリンタ部2において、221はレーザドライバであり、レーザ発光部201を駆動して、リーダ部1から出力された画像データに応じたレーザ光を発光させる。該レーザ光は感光ドラム202に照射され、感光ドラム202にはレーザ光に応じた潜像が処理される。この感光ドラム202の潜像の部分には現像器203によって現像剤が付着される。そして、レーザ光の照射開始と同期したタイミングで、カセット204及びカセット205のいずれかから記録紙を給紙して転写部206へ搬送し、感光ドラム202に付着された現像剤を該記録紙に転写する。現像剤の付着した記録紙は定着部207に搬送され、加熱及び加圧されることにより、現像剤が記録紙に定着される。定着部207を通過した記録紙は排出ローラ208によって排出される。ソータ220は排出された記録紙をそれぞれのビンに収納することにより、記録紙の仕分けを行う。尚、ソータ220にお

ける仕分けが設定されていない場合には、最上ビンに記録紙を収納する。また、両面記録が設定されている場合には、排出ローラ208まで記録紙を搬送した後、排出ローラ208の回転方向を逆転させ、フラップ209によって再給紙搬送路へ記録紙を導く。また、多重記録が設定されている場合には、記録紙を排出ローラ208まで搬送しないように、フラップ209によって再給紙搬送路へ導く。再給紙搬送路へ導かれた記録紙は、上述したタイミングで転写部206へ給紙される。

【0028】図3に、リーダ部1の詳細ブロック構成を示す。図3において、109はCCD、110はA/D変換及びシェーディング補正を行うA/D・SH部、111は各種画像処理を行う画像処理部、113はファクシミリ部3とのインタフェースを司るI/F部、115は操作者により指示入力や、装置の状態報知等が行われる操作部、117は外部装置11とのインタフェースを司るI/F部であり、SCSI、RS-232C等を備えている。

【0029】114はリーダ部1の各構成を統括的に制御するCPUであり、116はCPU114によって参照、実行される制御プログラムを格納したメモリである。メモリ116はEEPROM等によって構成され、本実施形態において書き換え対象となるメモリである。

【0030】CCD109から出力された画像データは、A/D・SH部110でアナログ/デジタル変換が行われるとともに、シェーディング補正が行われる。A/D・SH部110によって処理された画像データは画像処理部111を介してプリンタ部2へ転送されるとともに、I/F部113を介してファクシミリ部3へ転送される。CPU114は操作部115で設定された設定内容に応じて、画像処理部111及びI/F部113を制御する。例えば、操作部115でトリミング処理を行って複写を行う複写モードが設定されている場合には、画像処理部111でトリミング処理を行わせてからプリンタ部2へ転送させる。また、操作部115でファクシミリ送信モードが設定されている場合には、画像データ及び設定されたモードに応じた制御コマンドを、I/F部113からファクシミリ部3へ転送させる。上述した様に、このような処理を行うCPU114の制御プログラムはメモリ116に記憶されている。また、メモリ116はCPU114の作業領域としても使用される。

【0031】次に、メモリ116の詳細構成について説明する。図4は、図3に示すメモリ116の構成を示すブロック図である。図4において、メモリ116はフラッシュROM1161、EPROM1162、RAM1163により構成されている。また、118及び119はそれぞれCPU114のアドレスバス及びデータバスである。フラッシュROM1161はリーダ部1の通常動作のための制御プログラムを記憶しており、EEPROM等からなる書き換え可能な不揮発性メモリである。

EPROM1162はフラッシュROM1161を書き換える際のダウンロードプログラムを記憶している。また、RAM1163はリーダ部1のバックアップデータの記憶、及びCPU114の作業領域として使用される。

【0032】以下、上述した様な構成の画像処理装置10において、例えば外部装置11によりリーダ部1の制御プログラムを書き換える、所謂バージョンアップ処理を行う場合の動作について考える。この時、外部装置11はホストコンピュータであり、RS-232Cのインタフェース117を介して図4に示すフラッシュROM1161内に記憶する制御プログラムを画像処理装置10側に送信する。するとCPU114は、EPROM1162に記憶されたダウンロードプログラムを参照しながら、受信した制御プログラムをフラッシュROM1161に記憶させる。

【0033】この場合、フラッシュROM1161は書き換えモードになっており、通常の読み出し動作はできない。従って、リーダ部1では通常動作が行えない状態になる。そこで本実施形態においては、フラッシュROM1161の書き換えを行う際には、プリンタ部2およびファクシミリ部3にその旨を通知する。そして、プリンタ部2及びファクシミリ部3において、リーダ部1が動作していなければ動作することができないモジュールに関してはその動作を全て中止し、リーダ部1が動作していなくても動作可能なモジュールに関してはそのまま動作を続行する。例えば本実施形態においては、ファクシミリ部3において公衆電話回線を介して受信した圧縮画像データをハードディスク4に保存する機能のみが、リーダ部1の状態に関らず動作可能であるとする。

【0034】ここで、ファクシミリ部3の詳細構成を、図5のブロック図に示す。図5において、31はファクシミリ部3の動作を制御するCPUであり、32はファクシミリ部3における制御プログラムを保持するメモリである。メモリ32は書き換え不可能な不揮発性メモリ（マスクROM等）であり、受信モジュール及び送信モジュールを制御プログラムとして備えている。33、35はそれぞれ通信相手装置、リーダ部1とのインタフェースをとるI/F部であり、34は受信画像の伸張処理や送信画像の圧縮処理等を行う画像処理部である。尚、ファクシミリ部3においてI/F33を介して受信された画像データは、画像処理部34で伸張され、ハードディスク4に格納される。

【0035】以下、図6に示すフローチャートを参照して、本実施形態のメモリ書き換え実行時におけるリーダ部1の動作の詳細について説明する。図6のフローチャートに示す処理はリーダ部1のフラッシュROM1161のダウンロードを行う際の処理を示し、該処理を実現するプログラムは、EPROM1162にダウンロードプログラムとして予め記憶されている。該ダウンロード

プログラムは外部装置11から書き換え実行のコマンドを受信することにより起動され、CPU114によって実行される。

【0036】リーダ部1が外部装置11のホストコンピュータより書き換え実行のコマンドを受信すると、まずステップS101において制御プログラムが書き換え可能であるか否かが判定され、書き換え不可能であればステップS101に戻り、書き換え可能になるのを待つ。ここで、書き換え不可能である状態としては、画像処理装置10が現在複写処理やファクシミリ送信/受信処理等の動作中であるか、又は、紙詰まりや紙無し等の中間状態であるか、又は、ヒートローラの異常加熱等の何らかの異常状態である場合が考えられる。

【0037】ステップS101で制御プログラムが書き換え可能であればステップS102に進み、CPU114はプリンタ部2、ファクシミリ部3に対して、制御プログラムの書き換えが開始されたことを示す書き換え開始コマンドを送信する。この時CPU114は、制御プログラムの書き換え中であっても動作可能な機能の情報を、送信する書き換え開始コマンドに機能情報として付加する。

【0038】リーダ部1においては、メモリ116内にファクシミリ部3で動作するモジュールの一覧を備えている。即ち、ファクシミリ部3における受信モジュールと送信モジュールに関する情報を有している。尚、CPU114が、例えばファクシミリ部3のCPU31に対して、メモリ32内のモジュールの問い合わせを行うようにしても良い。

【0039】このように、ステップS102において書き換え開始コマンドを送信する際に、ファクシミリ部3で動作可能なモジュールを判定することができる。例えば、メモリ116内の動作モジュール一覧内に、書き換え時に動作可能か否かを示すフラグ等を設けておけば良い。ファクシミリ部3における受信モジュールにおいては、受信した信号をハードディスク4に格納するため、これはリーダ部1内のメモリ116が書き換え中であっても動作可能であるが、送信モジュールではリーダ部1が送信信号を生成する必要があるため、書き換え中には動作不可能である。

【0040】そしてステップS103に進み、CPU114は書き換え実行中の動作状態を操作部115に表示する。本実施形態においては、書き換え実行中である旨の表示と、ファクシミリの自動受信が可能である旨の表示を行う。

【0041】続いてステップS104に進み、フラッシュROM1161に対して制御プログラムの書き換えを実行する。この時、ステップS102で書き換え開始コマンドに付加された機能情報で示される機能（ファクシミリ部3における受信モジュール）のみが動作可能である。即ち、書き換え実行中にはファクシミリ部3におい

て電話回線を介して受信した圧縮画像データをハードディスク4に保存することが可能である。

【0042】フラッシュROM1161の書き換えが終了するとステップS105に進み、CPU114はプリンタ部2、ファクシミリ部3に制御プログラムの書き換えが終了したことを示す書き換え終了コマンドを送信する。

【0043】続いてステップS106に進み、CPU114は操作部115に、通常動作が可能である旨の表示を行い、その後、通常動作に戻る。例えば本実施形態においては、書き換え実行中にファクシミリ部3において受信処理が行われたのであれば、ハードディスク4に格納されている受信データをプリンタ部2から出力する。

【0044】尚、制御プログラムの書き換えによって画像処理装置10の機能が大きく変わってしまう場合には、画像処理装置10の本体電源を一旦オフにした後、再びオンとすることによりリブートをかけても良い。この場合、ステップS106において操作部115にその旨の表示を行い、操作者にリブートを促す。

【0045】次に、図7に示すフローチャートを参照して、メモリ書き換え実行時におけるファクシミリ部3の動作について詳細に説明する。

【0046】図7のフローチャートに示す処理はリーダ部1のフラッシュROM1161のダウンロードを行う際のファクシミリ部3における処理を示す。該処理を実現するプログラムは、ファクシミリ部3内の不図示のROM等に保持されており、CPU114から書き換え開始コマンドを受信することにより起動される。

【0047】ファクシミリ部3がリーダ部1より書き換え開始コマンドを受信するとまずステップS201において、受信した書き換え開始コマンドに付加されている機能情報から、ファクシミリ部3において動作可能なモジュール（受信モジュール）が選択される。次にステップS202に進み、ファクシミリ部3は動作可能なモジュールのみを実行可能な状態にする。そしてステップS203に進み、リーダ部1から書き換え終了コマンドを受信したか否かを判定する。受信していなければステップS202に戻り、書き換え終了コマンドを受信するまで、ステップS202における動作可能なモジュールのみの動作を続行する。ステップS203において書き換え終了コマンドを受信したらステップS204に進み、通常の動作に復帰する。

【0048】尚、本実施形態においては、制御プログラムの書き換え中に動作可能なモジュールとして、ファクシミリ部3における受信モジュールのみであるとして説明を行ったが、リーダ部1による直接の制御を必要としない機能であれば、ファクシミリ部3に限らず本発明が適用可能である。

【0049】以上説明した様に本実施形態によれば、画像処理装置の制御プログラムの書き換え中であっても、

該制御プログラムの動作に関らず動作可能な機能に関してはそのまま動作を続行することができる。従って、画像処理装置を効率良く稼働させながら、適宜バージョンアップを行うことができる。

【0050】<第2実施形態>以下、本発明に係る第2実施形態について説明する。

【0051】図8は、第2実施形態における画像処理装置の構成を示すブロック図である。図8において、51はリーダ部であり、不図示の原稿台に載置された原稿画像を読み取り、該原稿画像に応じた画像データをプリンタ部52及び画像入出力制御部53へ出力する。プリンタ部52はリーダ部51及び画像入出力制御部53から転送されてくる画像データに応じた画像を、記録紙上に記録して出力する。画像入出力制御部53はリーダ部51に接続されており、ファクシミリ部54、ファイル部55、コンピュータインターフェース部57、フォーマッタ部58、イメージメモリ部59、コア部60等からなる。

【0052】ファクシミリ部54は、公衆電話回線を介して受信した圧縮画像データを伸長し、該伸長された画像データをコア部60へ転送する。又、コア部60から転送されてきた画像データを圧縮し、該圧縮された画像データを公衆電話回線を介して指定された宛て先へ送信する。ファクシミリ部54にはハードディスク62が接続されており、受信した圧縮画像データを一時的に保存することができる。

【0053】ファイル部55には光磁気ディスクドライブユニット56が接続されている。ファイル部55はコア部60から転送されてきた画像データを圧縮し、光磁気ディスクドライブユニット56にセットされた着脱可能な光磁気ディスクに、該画像データを検索するためのキーワードとともに記憶させる。又、ファイル部55はコア部60を介して転送されてきたキーワードに基づいて、光磁気ディスクに記憶されている圧縮画像データを検索する。そして、検索された圧縮画像データを読み出して伸長し、該伸長された画像データをコア部60へ転送する。

【0054】コンピュータインターフェース部57は、パーソナルコンピュータ又はワークステーション（PC/WS）61とコア部60の間のインターフェースを司る部分である。フォーマッタ部58はPC/WS61から転送されてきた、画像を表現するコードデータをプリンタ部52で記録可能な形式の画像データに展開するものである。イメージメモリ部59はPC/WS61から転送されてきたデータを一時的に記憶するものである。

【0055】尚、コア部60の詳細については後述するが、コア部60はリーダ部51、ファクシミリ部54、ファイル部55、コンピュータインターフェース部57、フォーマッタ部58、イメージメモリ部59のそれぞれの間のデータの流れを制御するものである。また、

第2実施形態においては、外部装置63をホストコンピュータとして、リーダ部51内のメモリの書き換えを行うものとする。

【0056】尚、第2実施形態においてはリーダ部1及びプリンタ部2を一体の装置として備えるが、その側断面図は上述した第1実施形態に示す図2と同様であるため、説明を省略する。

【0057】図9に、リーダ部51の詳細ブロック構成を示す。図9において、159はCCD、150はA/D変換及びシェーディング補正を行うA/D・SH部、151は各種画像処理を行う画像処理部、153は画像入出力制御部53とのインタフェースを司るI/F部、155は操作者により指示入力や、装置の状態報知等が行われる操作部、157は外部装置11とのインタフェースを司るI/F部であり、SCSI、RS-232C等を備えている。

【0058】154はリーダ部51の各構成を統括的に制御するCPUであり、156はCPU154によって参照、実行される制御プログラムを格納したメモリである。メモリ156はEEPROM等によって構成され、本実施形態において書き換え対象となるメモリである。

【0059】CCD159から出力された画像データは、A/D・SH部150でアナログ/デジタル変換が行われるとともに、シェーディング補正が行われる。A/D・SH部150によって処理された画像データは画像処理部151を介してプリンタ部2へ転送されるとともに、I/F部153を介して画像入出力制御部53のコア部60へ転送される。CPU154は操作部155で設定された設定内容に応じて、画像処理部151及びI/F部153を制御する。例えば、操作部155でトリミング処理を行って複写を行う複写モードが設定されている場合には、画像処理部151でトリミング処理を行わせてからプリンタ部2へ転送させる。また、操作部155でファクシミリ送信モードが設定されている場合には、画像データ及び設定されたモードに応じた制御コマンドを、I/F部153からコア部60へ転送させる。上述した様に、このような処理を行うCPU154の制御プログラムはメモリ156に記憶されている。また、メモリ156はCPU154の作業領域としても使用される。

【0060】図10に、コア部60の詳細ブロック構成を示す。コア部60内において、120が画像入出力制御部53における他の構成とのインタフェースをとるI/F部、121は画像処理を行うデータ処理部、122はリーダ部51とのインタフェースをとるI/F部、123はコア部60全体の制御を行うCPU、124はCPU123によって実行される制御プログラムを格納したメモリである。

【0061】リーダ部51から転送されてきた画像データ及び制御コマンドは、それぞれデータ処理部121及

びCPU123へ入力される。転送されてきた画像データは、データ処理部121で回転や変倍等の画像処理が施され、制御コマンドの内容に応じて、I/F部120を介してファクシミリ部54、ファイル部55、コンピュータインターフェース部57のいずれかへ転送される。

【0062】また、コンピュータインターフェース57を介して入力される、画像を表すコードデータは、データ処理部121に転送された後にフォーマッタ部58へ転送される。そしてフォーマッタ部58で画像データに展開された後、該画像データはデータ処理部121に転送され、ファクシミリ部54やプリンタ部52へ転送される。

【0063】ファクシミリ部54からの画像データは、データ処理部121へ転送された後、プリンタ部52やファイル部55、コンピュータインターフェース部57のいずれかへ転送される。また、ファイル部55からの画像データは、データ処理部121へ転送された後、プリンタ部52やファクシミリ部54、コンピュータインターフェース部57へ転送される。

【0064】CPU123は、メモリ124に記憶されている制御プログラム、及びリーダ部51から転送されてくる制御コマンドに従って、上述したような制御を行う。尚、メモリ124はCPU123の作業領域としても使用される。

【0065】以上説明した様に第2実施形態の画像処理装置においては、コア部60を中心に、原稿画像の読み取り、画像のプリント、画像の送受信、画像の保存、コンピュータからのデータの入出力等の機能を複合させた処理を行うことが可能である。

【0066】次に、リーダ部51内のメモリ156の詳細構成について説明する。図11は、図9に示すメモリ156の構成を示すブロック図である。図11において、メモリ156はフラッシュROM1561及びRAM1562により構成されている。また、158及び159はそれぞれCPU154のアドレスバス及びデータバスである。フラッシュROM1561はリーダ部51の通常動作のための制御プログラムを記憶しており、EEPROM等の書き換え可能な不揮発性メモリである。また、RAM1563はリーダ部51のバックアップデータの記憶、及びCPU154の作業領域として使用される。

【0067】ここで図12に、フラッシュROM1561の内部構成を示す。図12に示す様に、フラッシュROM1561は1100~1115で示す16ブロックに分割され、各ブロック毎に個別のモジュールが格納されている。フラッシュROM1561は、書き換えを行う際に通常の読み出し動作ができない書き換えモードとなるが、書き換えを一時中断することで、読み出し動作が可能となる。また、フラッシュROM1561は書き

換えを該ブロック単位で行うことができる。

【0068】図12に示すフラッシュROM1561において、ブロック1100にはフラッシュROM1561を書き換える際にCPU154によって参照されるダウンロードプログラムが記憶されており、このブロックのみ、書き換えを禁止するためにハード的にプロテクトがかけられている。他のブロックに対して書き換えを行う際には、CPU154はブロック1100に記憶されたダウンロードプログラムをRAM1562に転送し、該転送されたプログラムを参照しながら制御を行う。また、ブロック1101からブロック1107まではリーダ部51に関する制御プログラムを記憶している。また、ブロック1108からブロック1112までは各操作部のプログラムを記憶しており、ブロック1113からブロック1115は予備領域とする。

【0069】以下、上述した様な構成をなす第2実施形態の画像処理装置において、例えば外部装置63によりリーダ部51の制御プログラムを書き換える、所謂バージョンアップ処理を行う場合の動作について考える。この時、外部装置63はホストコンピュータであり、RS-232Cのインタフェース157を介して図11に示すフラッシュROM1561内に記憶する制御プログラムを画像処理装置側に送信する。するとCPU154は、RAM1562に転送されたダウンロードプログラムを参照しながら、受信した制御プログラムをフラッシュROM1561に記憶させる。

【0070】第2実施形態におけるフラッシュROM1561は、書き換えモード時は通常の読み出しができなくなるが、書き換えを一時中断することで読み出しが可能となる。そこで第2実施形態においては、フラッシュROM1561の書き換えを行う際に以下のような制御を行う。

【0071】即ち、書き換えるブロックと無関係なブロック内のプログラムを組み合わせる実行できるモジュールに関しては、読み出し可能とする。そして、書き換えモード時に実行可能なモジュールに対して実行命令が発生した場合には、書き換えを一時中断して実行可能なモジュールに対する動作を優先的にを行い、該動作が終了した後、再度書き換えを行う。例えば、フラッシュROM1561内の制御プログラムに対して、特に図12のブロック1111に示すファイル操作部における機能を追加するための書き換えが行われる場合について考えると、この場合、コピー、ファクシミリ、プリンタの各操作部（それぞれブロック1109、1110、1112に対応）に関しては、通常の処理を行うことが許可される。

【0072】次に、図13に示すフローチャートを参照して、メモリ書き換え実行時におけるリーダ部51の動作について詳細に説明する。図13のフローチャートに示す処理はリーダ部51のフラッシュROM1561の

ダウンロードを行う際の処理を示し、該処理を実現するプログラムは、フラッシュROM1561のブロック1100に予め記憶されている。該ダウンロードプログラムは外部装置11から書き換え実行のコマンドを受信することによりRAM1562に転送され、CPU154によって実行される。

【0073】リーダ部51が外部装置11のホストコンピュータより書き換え実行のコマンドを受信すると、まずステップS301において制御プログラムが書き換え可能であるか否かが判定され、書き換え不可能であればステップS301に戻り、書き換え可能になるのを待つ。ここで、書き換え不可能である状態としては、画像処理装置10が現在複写処理やファクシミリ送信/受信処理等の動作中であるか、又は、紙詰まりや紙無し等の中間状態であるか、又は、ヒートローラの異常加熱等の何らかの異常状態である場合が考えられる。

【0074】ステップS301で制御プログラムが書き換え可能であればステップS302に進み、CPU154は書き換え対象であるブロック内のモジュールに関する機能を全て休止させる。例えば、上述した様にブロック1111に示すファイル操作モジュールに対する書き換えが行われる場合、CPU154はこれよりファイル操作が不可能となる旨を操作部155に表示し、画像入出力制御部53へファイル部55が無効であることを示すコマンドを発行する。尚、この時、操作部155において、ファイル操作に関する表示を全て停止しても良い。

【0075】次にステップS303に進み、画像処理装置は書き換えモードに移行する。そしてステップS304において、フラッシュROM1561に対して制御プログラム（この場合ブロック1111のみ）の書き換えを実行する。

【0076】そしてフラッシュROM1561の書き換えが終了するとステップS305に進み、書き換えモードを終了する。続いてステップS306において、ステップS302で書き換えのために休止させたモジュールを再起動する。

【0077】以上説明した様にして第2実施形態におけるメモリ書き換え処理が実行されるが、第2実施形態においては、上述した様にメモリ書き換え中においても他の操作を優先して実行することの特徴とする。以下、書き換え処理中の割込み中断処理について、図14のフローチャートを参照して説明する。

【0078】上述した図13のステップS304に示す書き換え処理実行中において、何らかの動作可能モジュールに対する実行要求の割込みを受けたとする。例えば、図12に示すブロック1112のプリンタ操作部内のモジュールに対するプリント実行命令等が、この割込み要求に該当する。するとCPU154は割込み中断処理を開始する。まずステップS311において、CPU

154はフラッシュROM1561のブロック1111に対する書き換えを一時中断し、フラッシュROM1561を読み出し可能な状態にする。

【0079】次に、ステップS312に進み、動作要求があった動作可能モジュールを実行する。そして該モジュールの動作が終了したらステップS313に進み、他の動作可能モジュールに対する動作要求割り込みが有るか否かを判定する。他のモジュールに対する割り込みがあった場合、処理はステップS312に戻って当該モジュールを実行する。

【0080】一方、ステップS313において他の割り込みがなければステップS314に進み、ステップS311による書き換え処理の一時中断を解除しフラッシュROM1561を書き換え可能な状態にする。

【0081】そして、図13に示すステップS304に戻り、書き換え処理を再開することができる。

【0082】以上説明した様に第2実施形態によれば、画像処理装置の制御プログラムの書き換え中であっても、優先度の高い処理については、書き換え処理を中断して該処理を実行し、その終了後に書き換え処理を再実行することができる。従って、画像処理装置を効率良く稼働させながら、適宜バージョンアップを行うことができる。

【0083】また、本発明は、ホストコンピュータ、インタフェース、プリンタ等の複数の機器から構成されるシステムに適用しても、複写機等の1つの機器からなる装置に適用しても良い。また、本発明はシステム或は装置にプログラムを供給することによって実施される場合にも適用できることは言うまでもない。この場合、本発明に係るプログラムを格納した記憶媒体が本発明を構成することになる。そして、該記憶媒体からそのプログラムをシステム或は装置に読み出すことによって、そのシステム或は装置が、予め定められた仕方で動作する。

【0084】

【発明の効果】以上説明した様に本発明によれば、画像処理装置の制御プログラムの書き換え中であっても、該制御プログラムの動作に関らず動作可能な機能に関してはそのまま動作を続行することができる。

【0085】また、制御プログラムの書き換え中であっても、優先度の高い処理については、書き換え処理を中断して該処理を実行し、その終了後に書き換え処理を再実行することができる。

【0086】従って、本発明によれば、画像処理装置を効率良く稼働させながら、適宜バージョンアップを行うことができる。

【0087】

【図面の簡単な説明】

【図1】本発明に係る一実施形態における画像処理装置の構成を示すブロック図である。

【図2】本実施形態におけるリーダ部1及びプリンタ部2を一体とした装置の側断面図である。

【図3】本実施形態のリーダ部1の構成を示すブロック図である。

【図4】本実施形態のメモリ116の詳細構成を示すブロック図である。

【図5】本実施形態のファクシミリ部3の構成を示すブロック図である。

【図6】本実施形態においてリーダ部1内の制御プログラムを書き換える処理を示すフローチャートである。

【図7】本実施形態において制御プログラムを書き換える際のファクシミリ部3の動作を示すフローチャートである。

【図8】本発明に係る第2実施形態における画像処理装置の構成を示すブロック図である。

【図9】第2実施形態におけるリーダ部51の構成を示すブロック図である。

【図10】第2実施形態におけるコア部60の構成を示すブロック図である。

【図11】第2実施形態におけるメモリ156の詳細構成を示すブロック図である。

【図12】第2実施形態におけるフラッシュROM1561のメモリ構成を示す図である。

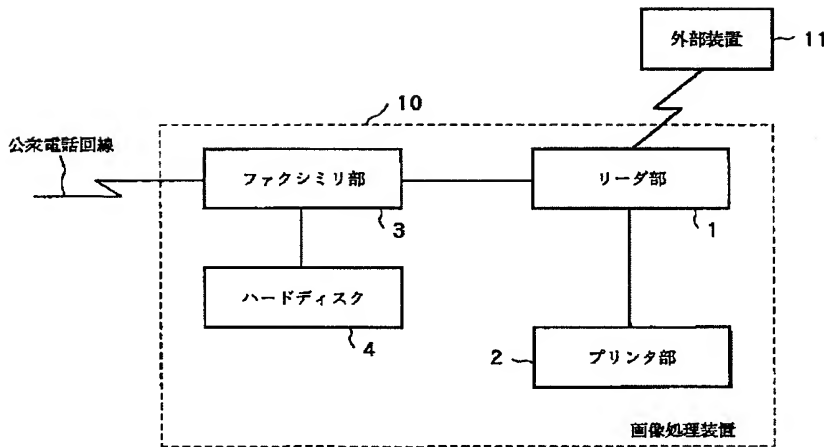
【図13】第2実施形態においてリーダ部1内の制御プログラムを書き換える処理を示すフローチャートである。

【図14】第2実施形態において制御プログラムを書き換える際の割り込み処理を示すフローチャートである。

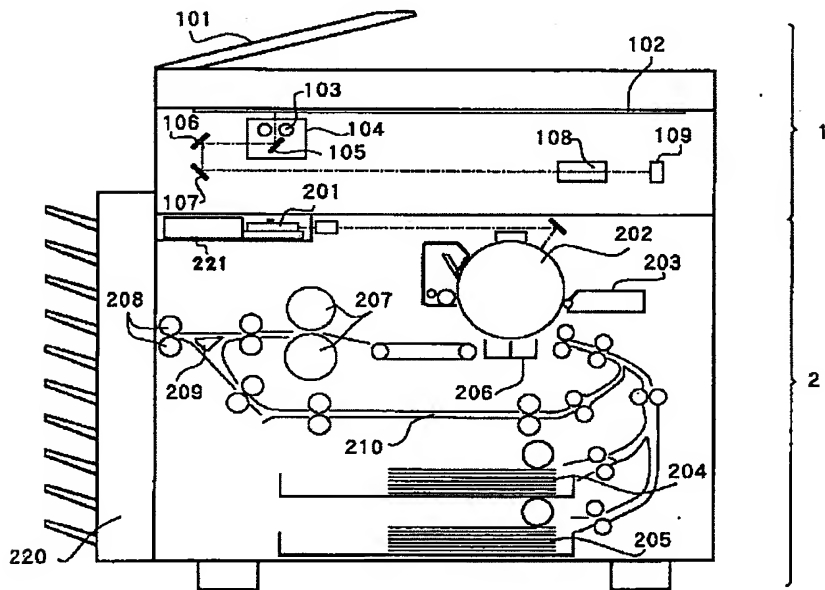
【符号の説明】

- 1 リーダ部
- 2 プリンタ部
- 3 ファクシミリ部
- 4 ハードディスク
- 11 外部装置
- 111 画像処理部
- 114 CPU
- 115 操作部
- 116 メモリ
- 1161 フラッシュROM
- 1162 EPROM
- 1163 RAM

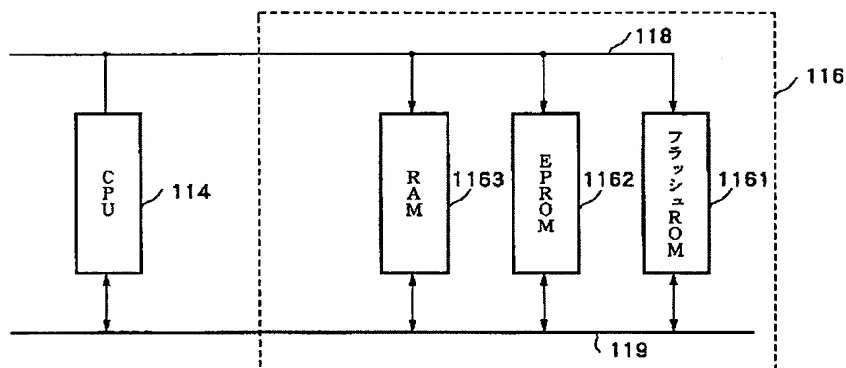
【図1】



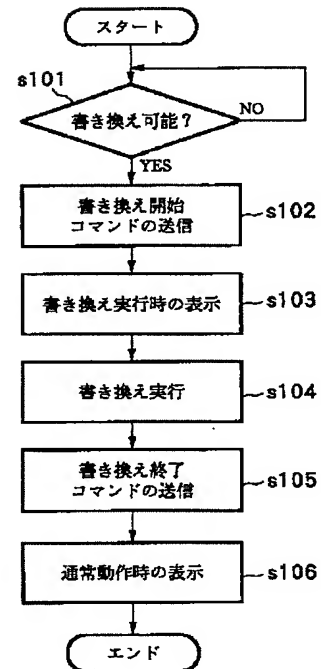
【図2】



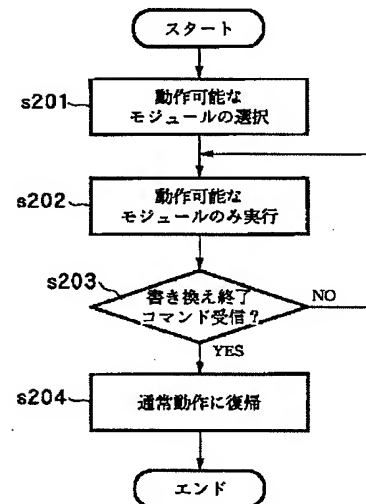
【図4】



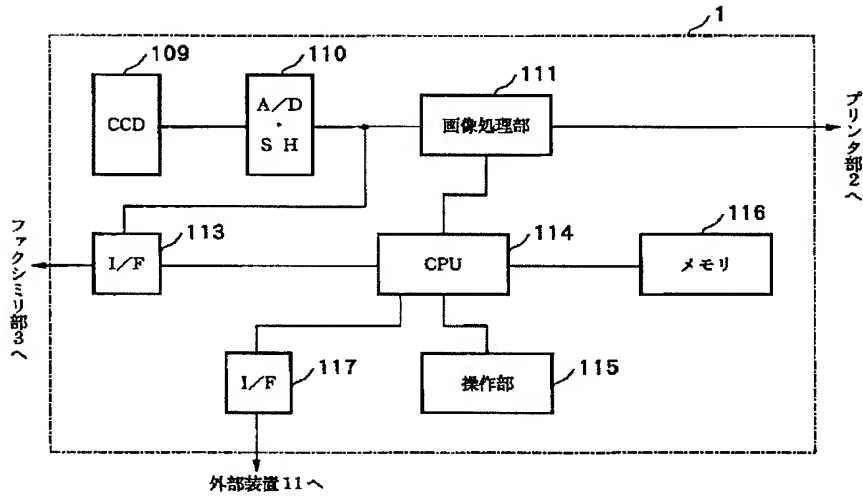
【図6】



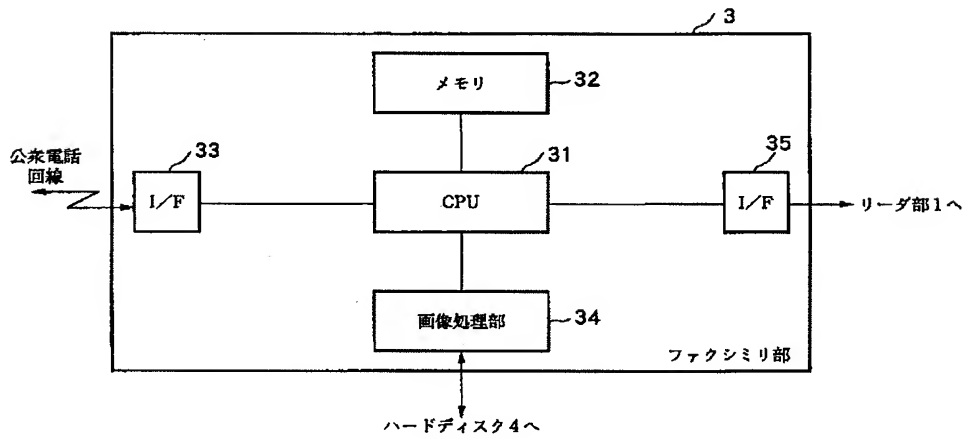
【図7】



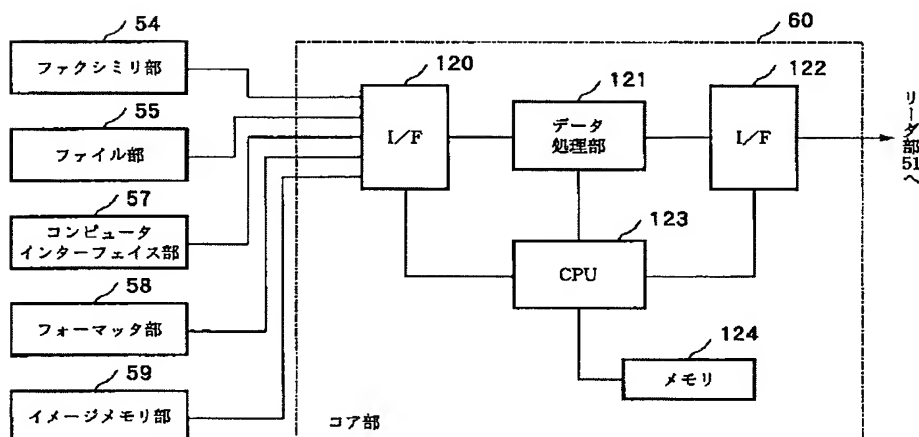
【図3】



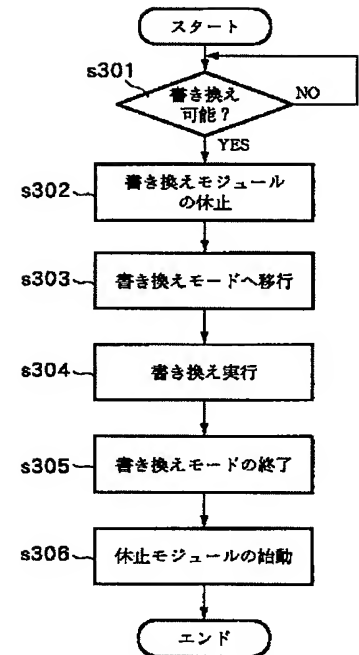
【図5】



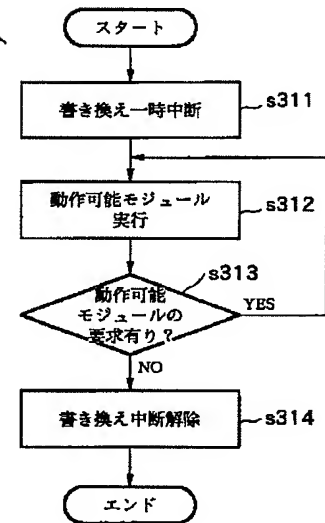
【図10】



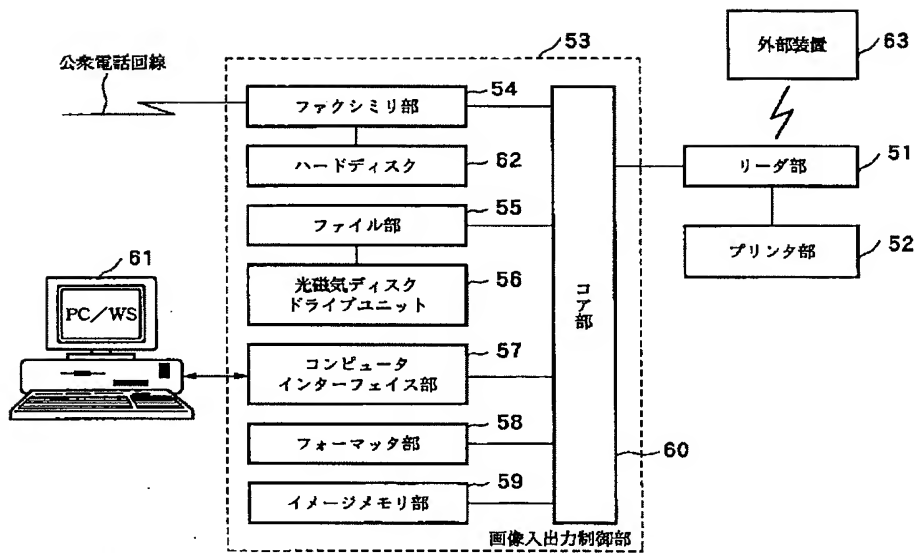
【図13】



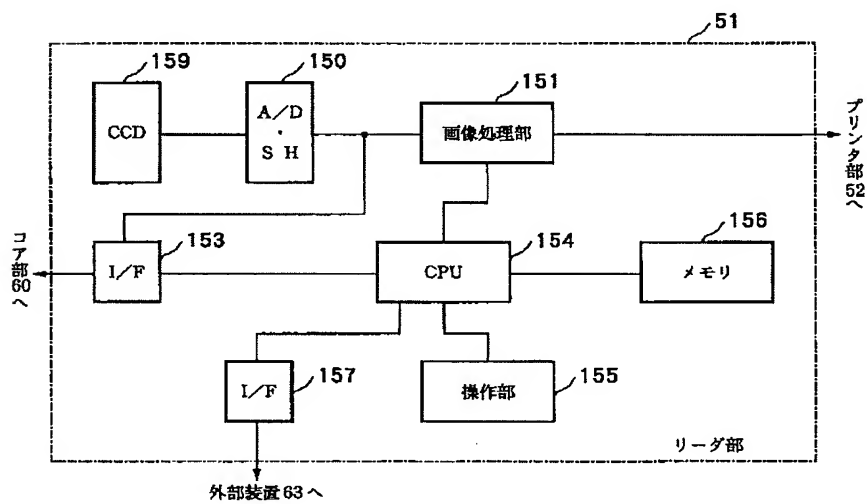
【図14】



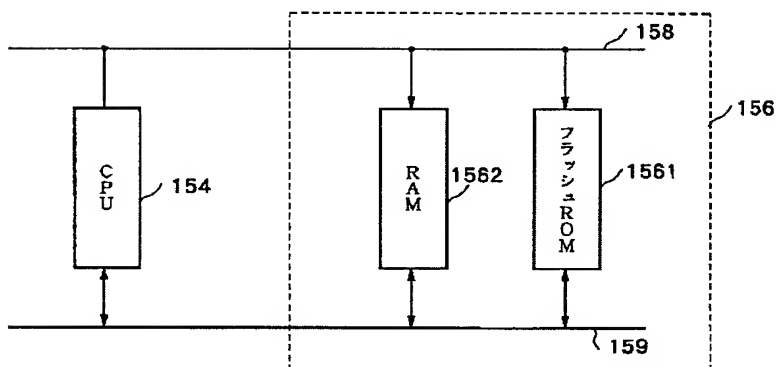
【図 8】



【図 9】



【図 11】



【図 1 2】

書き換えプログラム	〜 1100	操作部共通	〜 1108
I/F 制御	〜 1101	コピー操作部	〜 1109
画像処理部	〜 1102	ファクシミリ操作部	〜 1110
画像処理部	〜 1103	ファイル操作部	〜 1111
シーケンス制御	〜 1104	プリンタ操作部	〜 1112
シーケンス制御	〜 1105		〜 1113
シーケンス制御	〜 1106		〜 1114
シーケンス制御	〜 1107		〜 1115

